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Online Real Estate Management System

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ABSTRACT

In the year 2000, there was a drastic demand for new property in Malaysia. With the astonishing growth of the Internet, real estate companies are beginning to find new ways to expand their businesses as Internet and E-commerce has given businesses the ability to interact closely with end consumers. Online real estate is expected to meet the increasing demands for the new properties.

Online Real Estate Management System is a development of an automated system for property-related service on the Internet. This project is aimed at developing a web based online real estate application. With this system, real estate agents, potential buyers, sellers, landlords, and other parties in real estate dealings can easily collaborate in a secure Web environment. This automation uses e-commerce to increase buyers' utility through information accessibility and efficiency in real estate dealings compared to the traditional business approach. The main features of this website would be post and view property listings; search for commercial, industrial, and residential property; and calculate loan amount.

Features mentioned above are expected to speed up the buying and selling process; provide an easier, convenient and faster mode for finding relevant details about commercial, industrial, and residential properties for rent or for sale; promote online property advertising and listings; and provide the user with unsurpassed service and content when it comes to shopping for property online.

ACKNOWLEDGEMENT

A paper on developing a complex system like Online Real Estate Management System will never just "happens". Without the innovative thinking and support of many people, works on the system would not have completed as scheduled. The good fortune has enabled the work of the system with a group of people who are professionals in both academic and development environments.

The most pleasant task here is expressing the gratitude to *Associate Professor Diljit Singh*, supervisor of this project for spending his time and efforts from the beginning until this research paper is produced. The support and encouragement from him is very much appreciated. Deepest gratitude is for *Mrs. Hannyzzura Pal*, my first moderator and Mr. Teh Ying Wah my second moderator of the project for providing views and suggestions from different perspectives.

A special thanks to *few of my friends and my father's friends* for contributing helpful insights, suggestions and support for this project. Finally, particularly indebted to other members who are my *Seniors* for contributing ideas and suggestions to the modules and parts being developed.

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CHAPTER 1

INTRODUCTION

1.0 Background To Project

On-Line Real Estate Management System is a system developed to fill up the lacking of features in the currently available system on the Internet. The systems available are still incomplete and lacks of some innovative features that can make it better. The system as what it is aimed to be – a self-complement system that will cater all needs of people interested in real estate market, either buying, selling or even for the developers to seek potential real estate buyers will take into consideration of needs of these users. Besides that, On-Line Real Estate Management System also aims to provide first class service to both real estate owners and real estate seekers in an easy-to-manage environment to Real Estate Company.

1.1 Project Review

Since On-Line Real Estate Management System is developed for the usage of an individual based real estate company, the system provides services to various kinds of users which can generally be categorised into two types which are the users from the real estate company and also the users from outside the company which is referred to as the external users. Real estate company users will involves people from the management, the system administration and the public who'll be the property seekers or property owners. On-Line Real Estate Management System will provide features that will be able to satisfy the needs of the above-mentioned users.

All the real estate sites currently available on the Internet only offer the basic and essential features for its users such as the property postings, news corner, loan calculator, property search engine, real estate activities' guidelines, online inquiry form and many others. Some of the more established system has more features to enhance the function of the site while some others lack of certain features that are worth to be added in. A major disadvantage of web-based real estate system offered nowadays is lack of new feature that can provide a friendlier environment to its users .

On-Line Real Estate Management System – as what it aims to be, incorporates the advantages and good point of the web sites mentioned above in its development while the disadvantages will be avoided. Realising the disadvantages of the foresaid system, On-Line Real Estate Management System incorporates additional features to overcome the disadvantages of the foresaid system.

To serve the different types of users of the system, the concept of the system is designed specifically to their needs. Priority of design is given to external users where they are actually the client or maybe a potential client of a real estate company.

For the users from the real estate company, there are three types of them, which are the Management, System Administration and Public. For management, they can view the status of the system; check the system performance and thus monitoring the efficiency of the system. Besides that, management will be able to update any news or policy in the system. While the administrators, they can better manage the system and

fine-tuning the system performance. While for public, they can monitor their property item and manage their properties by using the system. These are the basic requirements tried to achieve by the system.

Self-complement, a characteristic of this system, which is to provide anything that anybody needs in his or her process of buying, selling or renting a real estate item. Besides offering the basic features that are currently available in real estate system on the Internet. On-Line Real Estate Management System, does incorporate a few new features that will better serve its users and increase the efficiency of the business process through the offerings of *financial consultant* and *auction house* in a real estate system.

Firstly, on the financial consultant which is an alternative searching method in addition to the conventional searching method for the property hunters to find a dream real estate item. It will caters to those who might feel indecisive over what to look for in property search where the system will analyses their financial status and suggest to them the real estate item to look for.

On-Line Real Estate Management System provides a few ways for real estate seekers to communicate with property owners or the management, which are sending a note to the person involved, or get the contact numbers or e-mail address of the owner displayed at the search page.

As online bidding is gaining its popularity in Internet with more and more established auction house, too perform auction online, On-Line Real Estate Management System also incorporates an auction house in the system where real estate item is put up for auction. This is to serve those who prefer to look for more valued item. Any user registered with system will be eligible for the auction once they submit additional information vital for the auction process.

There are so many who are interested in the real estate market, but little knows about the correct procedure in buying a property. Realising this, the system provides a step-by-step guide for them in realising their dream of owning a property. Guides on performing a property transaction, fees involved, documents and other things that are involved in the process of buying or selling a real estate item are provided. Others features that are commonly found in other real estate system throughout the Internet like providing the housing loan scheme will too be incorporated in the system.

On-Line Real Estate Management System, is a system which aims to provide all necessary facilities to both its users at the side of buying or selling a property item would make sure that everything which is needed will be served. Property seekers will be provided with any necessary information on their way to buy a real estate item while for real estate owners, they can have the benefits of real estate system's help them to deal the property for them.

1.3 Objectives Of Project

The objectives of the system is vital for capturing the concepts of developing a particular system, therefore, it is important to outline the system objectives before any further development or planning is carried out. A number of objectives have been outlined for this system, which include:

- ***To provide the latest and up-to-date information regarding properties, land owners and clients (public).***

- ***To provide opportunity to any users to register with system to sell and rent their properties***

- ***To create a system which is good in sense of security by only allowing user to access with valid ID and Password.***

- ***To improve or enhance the quality and accuracy of data keeping.***

- ***To allow authorized user to maintain the whole system.***

- ***To ease users in searching their interested properties located in Kuala Lumpur***

1.4 Scope Of Project

- Online Real Estate Management System focuses to manage all the lands in **Kuala Lumpur**
- The proposed system is a web-based system that is designed for the use of normal users, agents and maybe directly by any companies.
- This system will be divided into two main modules, which is
  i. Public Module
  ii. System Administration Module

Public Module

- General users of the system who are not employed by the real estate company
- Divided as property owners and property seekers
- Uses the system to obtain information of properties

System Administration Module

- Selected staff who are responsible to maintain the system and database
- Back-up data in the database
- two groups involved, that is managerical level (possess decision making power in the company) and normal staff level (clerks and executives)

1.5 Importance of Project.

- To enable the control and management of real estate to be done easily via web technology.
- Create databases that can store various type of related information of the real estate property and user account for security purposes. It should be secure enough so that contents in the database are not alterable in the non-permitted ways.
- To enable authorized user or personnel to access, view and update their information anytime and easier by storing all records in centralized database, it will save the user's time and reduce the processing time.
- To provide accurate, persistent and relevant property information.
- To create a paperless environment through the system and avoid redundant paper works, it will contribute to the cost saving aspect in terms of paper cost and paper storing facilities.
- Allow authorized user to maintain the database. Database records that can be maintained by a particular user depend on the level of restriction.
- To provide a harmonic and user-friendly environment.

1.6 Project Definition

1.6.1 E-Commerce

Electronic commerce (e-commerce) is the buying or selling of goods or services on the Internet, especially the World Wide Web. Sometimes, it is referred to as e-business and e-retailing. According to EC Innovation Centre, e-commerce means "the enablement of a business vision supported by advanced information technology to improve efficiency and effectiveness within the trading process".

"A modern methodology that addresses the needs of organisations, merchants and customers while improving the quality of goods and services and also increase the speed of service or service delivery. It involves the application of multimedia technologies in the automation, designing transactions, workflows to aim at the current business competition." – this is also another definition provided by various groups in the industry about electronic commerce. Definition of e-commerce can be so different but it concentrates on one thing which is the usage of information technology to speed up the business process.

There are a few technologies introduced to improve the effectiveness of trading relationships. The application level's typical technologies includes *fax*, *Electronic data interchange (EDI)*, *Electronic mail (e-mail)*, *voice messaging*, *electronic catalogues*, *electronic funds transfer*, *technical data interchange*, *electronic forms* and *workflow*.

Category of E-Commerce

There are four categories of E-Commerce which are :

- Business to Business
- Business to Administration
- Business to Customer
- Customer to Administration

Business to Business :

This category of E-commerce has been well established for several years, particularly using Electronic Data Interchange (EDI) over private networks. Company to place order for their goods, receiving invoices and also making payments, uses network to conduct its operations.

Business to Administration :

This category is still in its starting phase, but it would expand rapidly as our country through the development of one of the flagship under Multimedia Super Corridor – e-government will conduct operations through e-commerce.

Business to Customer :

This category mostly refers to electronic retailing. It expanded greatly with the popularity of the www. More and more online retail stores are now emerging over the Internet that offers all kinds of consumer goods.

Customer to Administration :

This category is still in its conceptual period and not yet being implemented. However, in the wake of a growth of both the Business to Customer and Business to Administration categories Government may extend electronic transaction to such areas as welfare payment and self assessed tax returns.

1.6.2 Real Estate

Real Estate is all about land or well known as properties (land). People without land nowadays can't be found anywhere, so with this get to know that every human being in this world are towards to own or rent any land properties. So with this we have to know that this term is very important in this project. This project is all about to manage this kind of properties.

CHAPTER 2

LITERATURE REVIEW

2.0 Role of literature review

In previous chapter, introduction to the system is done. While in this chapter, the comparisons between the currently available systems on the Internet and On-line Real Estate System are made. A detailed study is done on reviewing the different real estate management system, system architecture, system platform, database system, development tools, and others. At the end of this chapter, a synthesis is provided to summarise the information collected through literature review. Before any further detailed information is being elaborated, the motivation on how the ideas of the system are generated is being discussed.

2.1 Approach to literature review

This approach is being done so that this project will be studied well before implementing it. To come up with a lot of idea how to develop a better system than the existing ones, there a few different kind of approach that has been done as listed below :

Referring to :

- Existing Web Page
- Books
- Search Engines
- Online Tutorials
- Parents
- Friends

2.2 System Comparison

Research had been conducted on both the local and foreign countries' real estate agent web sites to get a better view and understanding of how a real estate agent web site is currently implemented. Besides that, the advantages and disadvantages of these web sites are compared as well.

2.2.1 Local Web Sites

i) PropertyZoom.com

This is one of the best real estate web sites that have been visited so far. This site contains a lot of information related to the real estate market. PropertyZoom.com has an effective and flexible advertising media tool. The convenience of shopping from home or office is one of the advantages of this website.

This site also provides basic services offered by most real estate web sites like search engine, news on real estate market, information and links to financial institution. Loan calculator is also provided together with many other attractive features such as shopping cart, currency converter, forwarding certain property details to friends by email, online bank loan application and collective information like interior design guide, home financing guide, home insurance guide, neighbourhood guide and map, property trends and news, e-developer and e-retailer.

PropertyZoom.com also provides full information of certain places together with some pictures to give clear details to users. It also allows users to register and put up their

property to be listed in the search directory. It uses attractive user interface with some animation in it. The screen organisation is done in a very user friendly way. For example, the loan calculator and email form are placed on the right side of every detail property search screen to provide convenience to users in order to perform loan calculations or sending property information to a friend immediately after finished reading the property details.

Search on property items can be performed directly in this site's main page by entering the property code. In its main search screen, all criteria are divided into three categories such as selecting area, property criteria and price range. Besides that, it also includes criteria for the purpose of sorting search results. Other features are such as providing shopping cart functionality and displaying search results of ten per page.

ii) Malaysian Institute of Estate Agents (MIEA)

This web site provides features like property searching, guidelines on real estate, loan calculator, latest real estate news and information of financial institutions where loans can be applied. As the recognised body representing all Registered Estate Agents in the country, this site projects a more formal representation on its site where lots of information on the procedures and activities of real estate market can be found. The Malaysian Institute of Estate Agents (MIEA), formerly known as the Malaysian Association of Real Estate Agents (MAREA) is. It was formed in 1974, but officially registered on April 14th 1977, with the Registrar of Societies, Malaysia.

Besides that, there is a full list of real estate agents (who are also the members of MIEA) where users can choose. All these information are well organised into four categories, which are the property centre, finance centre, news centre and agent centre. There are some animations designed in this web site that are able attract users' attention to certain information like upcoming events, latest added properties and others. One good point about the design of this site is that the interface is made simple by adding just a few nice images and pictures, which are of ideal sizes and this makes the download speed of its web pages become faster. Although being simple, the design of the web pages looks nice and appealing.

The property search in this site can be performed in two methods which are the normal search mode and the advanced search mode. In the advanced search mode, users can either select to view all the records found from normal search or continue on to narrow down the search results by entering advanced search criteria.

iii) Metrohomes

Basically, this site has the basic features like properties search, listing of new projects, latest real estate news and loan calculator. The outstanding features of the site is on its loan calculator where it can perform many different types of calculations like various fees plus duties imposed on different property transactions, monthly payment for a loan and total loan based on property price.

The currency converter tool is another selling point of this site, which is helpful in knowing the value of a currency equivalent to another different currency. Besides that, it also contains sections for users to submit their inquiries, suggestions and comments by filling an online form, and also a career section where job opportunities in the company are being advertised here.

The property search section is divided into two pages, which consist of two steps of entering criteria with one step on each page. This can limit too many search criteria to contain in one page. The search results screen displays only 20 records per page to enhance the loading time. Selecting the property code for a particular record in the search results screen can link to the property's detail screen that shows most of the information needed by property seekers. Along in this detail screen, a link is provided for sending property inquiry email to Metro Homes.

This site has an attractive main page with a good combination of background colours. Instead of using pictures and images to design its web page interface, attractive text styles, logos and combinations of colours are also being used to make the web pages attractive. This site does not use any animation at all.

iv) Malaysiarealty.com

This web site is a real estate portal that offers features such as property searching and properties advertisement where users can put up their property in the search directory

for this website where fees will be charged for listing a property together with picture and free of charge for listing property without a picture. Apart from that, it also provides many guidelines about real estate such as legal advise for property buyers, home financing and insurance guide, interior design and many others. Besides that, there is also a search engine called 'Meta Crawler' that is incorporated into this web site for the convenience of users to search for other information in the Internet.

The screen appearance of this website is enhanced with the usage of some animations. However, there are some drawbacks in its design which is there are too many unrelated links to other web sites like providing shopping for cars, books and etc. Although this may look convenient to users, but too many unrelated links can result in losing focus of its main purpose, which is to relate to real estate.

The property search offered in this web site only has two criteria for searching that are located in the main page such as property type and developer's project. In the actual search screen, there are too little guidelines for users to perform property search and contains only one criteria, which is property type. Below this search screen are a few search engines such as Hot Bot, InfoSeek and Lycos. There is also an added feature where users are able to look for some particular real estate agents according to the specified location.

v) Oasis Properties

The main business of Oasis Properties is to locate ideal homes and office spaces for expatriates taking up residence in Malaysia and includes Individuals, Large Corporations and Diplomatic Missions. This web site concentrates on sales and rental of top quality properties and real estate within Kuala Lumpur, Malaysia. It offers some of the basic features that a real estate web site would have like online inquiry form and guidelines on real estate activities for buying and selling of properties. Information provided by this web site is very little and limited.

The interface of this web site is quite poor and is not very user friendly. The horizontal size of each web page is too big that it cannot be fit in the screen properly and users have to drag the scrollbar left and right to view the web page. Besides that, all property search results are being displayed in a bordered table form, which does not look attractive. If there is too many search results, the size of the table will increase and all the data will be crumbled up. This will make it look confusing and users might feel that they will have a hard time viewing the information provided.

This web site lacks of the most important feature provided by any real estate web sites which is this website does not has is the property search feature. It only has a property listing function that gave users no choice for searching.

2.2.2 Foreign Web Sites

i) Midland Realty

This is the real estate web site which provides free and comprehensive information on the Hong Kong property market and is updated on daily basis to ensure accuracy. It provides functions like the property search, rules in real estate, property guides, property news and headline, housing loan schemes, analysis report, loan calculator and many others. Property seekers can search for their dream property by filling up the online search form or by clicking on the location on the map provided. Its property search returns a complete list of properties that met the user's requirement and it is well organised in a table form.

Multi-language feature is one of the most outstanding features of this web site where users can choose to view this web site either in English or Mandarin. This is an important feature where it can attract those users who do not know how to read in English. This is because most of the real estate sites in Hong Kong were developed using Mandarin as the main language and this will restrict some users especially foreigners from using the facilities offered by the web sites.

ii) Propertybuyers.com

Propertybuyers.com is a Singapore-based real estate web site and is one of the good real estate web sites that should be visited. This site provides a very good interface design with colourful pictures and some animations. Image mapping is being used to increase

the loading speed too. All information is well organised in several sections that simply clicking on the icons provided at the main page can access them.

Selling, buying, leasing and renting property, latest launches, financial information, property trends and analysis for certain years, financial calculator and others essential features are provided in by this system. One of the attractive features in this site is its discussion forum for real estate issues that is open to anyone. The search function of this web site actually divided into four categories. Users can choose to buy, rent, sell or lease properties from the options provided. In each of these options selected, there is a criterion for choosing a property type. After selecting one type of property, the advanced search begins by providing more search criteria for users to enter and choose.

The search result returns a comprehensive list of properties, which is being displayed in a very organised way, in columns. Information on a particular property is provided in detail with a map showing the location of the property. If property seekers are interested in a property, they can sign up as a member by filling up their personal information posted to the management and arrangement for the property owner to contact them using that information will be provided.

iii) Century 21st Singapore

This site has a very attractive and appealing interface design. It uses some animations and has a very good combination of background colours. The contents in this site are well organized into a few parts, which can be accessed by just clicking the icons on the

main page. Comprehensive list of properties for any type of property being searched is displayed in an organised way. However, it has only one very simple search feature that contains one criteria and one listing feature that limit users' choices of searching.

Besides providing general information, this site also displays added information such as interior condition of a property, valuation price and others. There is also a link to contact the related agent, which can be selected from the drop down list or from the map shown. It also provides facilities for either property owners or real estate agents to put up their property to be rented or sold. Other information is such as open house listing, career opportunity, company offices and branches.

iv) Singaporehomes.com

This is the web site that provides a ONE-STOP information-based properties portal for all in Singapore and abroad (foreign investors). Features provided in this site are like property search, regulations, financial institutions' interest rates, interior design guides and other home-related services. There is also other links to information like 'feng-sui', fitness centre, Country club and others. Use of animations makes the web site lively and attractive but too much information is squeezed into one page, which makes the web page looks complicated and less organised.

v) Realtor.com

Realtor.com provides a very complete and comprehensive real estate agent-based website. It is a highly successful web site with an average of over 1.3 million listings from all over the United States. Users can search the database for the sale of homes or detailed information on the available homes and their surrounding neighbourhoods as well as finding an agent to assist them in the buying or selling process.

Property search, selling and buying guides, financial calculator, online forum and others are provided by this web site. There are many discussion topics on the forum like home improvement, finance, homes, insurance, decorations, home safety and many others. Basically, the information posted on this web site is divided into two categories, which are for consumers and realtors.

This site offers two types of property search; one by using map and the other one is by filling up and selecting some listed selection provided. This is to provide a flexible searching method for users. In addition to that, this web site provides users real estate Q&A (Questions and Answers), real estate news, financial centre, furniture and appliances, home improvement, insurance and many others.

Information in this site is displayed in an organised way and it has a friendly user interface. From the main page, users can accessed all types of real estate related information by just a click away.

2.2.3 Summary

After making reviews on the different websites, it is found that those websites, either local or foreign countries' only provide basic yet essential features. The common features available in these websites are:

- Search Engine
- Loan Calculator
- News Corner
- Real Estate Activities' Guidelines
- Online Inquiries Form

Online Real Estate Management System, on the other hand has a few advantages over the currently available real estate management system on Internet of which Online Real Estate Management System provides the following features:

- Info centre
- Help Centre
- Financial Consultant
- Auction House

The first four features in Online Real Estate Management System are identical to the one available in most real estate web sites where search engine, loan calculator, Info centre and Help Centre can perform the same functionalities of those features in other web sites. In addition to that, Online Real Estate Management System provides additional features that will help in making Online Real Estate Management System a

system with higher efficiency and capabilities. The additional features in Online Real Estate Management System are Financial Consultant and Auction House.

The inclusion of Financial Consultant as a module of the system is to generate users from the group who is not knowledgeable on what kind of property item to look for. With financial consultant, users only need to enter their financial and personal information and the system will help to generate the list of property item, which are suitable for them.

Besides that, auction house is provided as a place where users can put up their property in this auction house to be auctioned. Users can also participate in the bidding to get any property they wanted, as online bidding or auction is becoming more and more popular. The auction house will certainly provide benefits to both the company and also the property seekers.

Apart from the features that are lacking in the web sites being reviewed, lots of other information and knowledge can be gained from this research like the presentation of the web sites, the organisation of it and others. All the advantages and good points of these websites will be incorporated into the development of Online Real Estate Management System if possible and on the other hand, the disadvantages will be avoided as much as possible too.

CHAPTER 3

METHODOLOGY

3.0 Project Objectives

The objectives of the system is vital for capturing the concepts of developing a particular system, therefore, it is important to outline the system objectives before any further development or planning is carried out. A number of objectives have been outlined for this system, which include:

- ***To provide the latest and up-to-date information regarding properties, land owners and clients (public).***
- ***To provide opportunity to any users to register with system to sell and rent their properties***
- ***To create a system which is good in sense of security by only allowing user to access with valid ID and Password.***
- ***To improve or enhance the quality and accuracy of data keeping.***
- ***To allow authorized user to maintain the whole system.***
- ***To ease users in searching their interested properties located in Kuala Lumpur***

3.1 Development Methodology

3.1.1 System Analysis

System Analysis is a most important phase in a software development life cycle. It is the process of gathering and interpreting facts, diagnosing problems and using the information to recommend improvements to the system. The information gathered during this phase has provided alternative strategies to develop this system. This alternative strategy is in terms of what methodology and development tools are most suitable to develop this system, and there are several methodologies and development that being considered. From the information I get from Literature Review in Chapter 2 justify among the methodologies and development tools and give reasons why I see a certain methodology or development tool to develop my system but not others.

The purposes of this analysis phase are:

- Justify which methodology is the most suitable methodology to be used to develop my proposed system.
- Justify which kind of hardware and software which will be used to develop the system, this includes operating system, web application language, web technology, scripting language, web application development tools, web browser and web server.
- Analysis what are the smart features from the existing system can be incorporated in my system.
- Introduce new and smart features in my proposed system's modules.
- Justify what are the limitations of my proposed system.
- Justify what are the non-functional requirements that should be considered.

3.1.2 Waterfall Model With Prototyping

Waterfall Model with prototyping has been chosen as the system process model. The figure below shows the waterfall model with prototyping. This system process model contains seven phases, which are described as below:

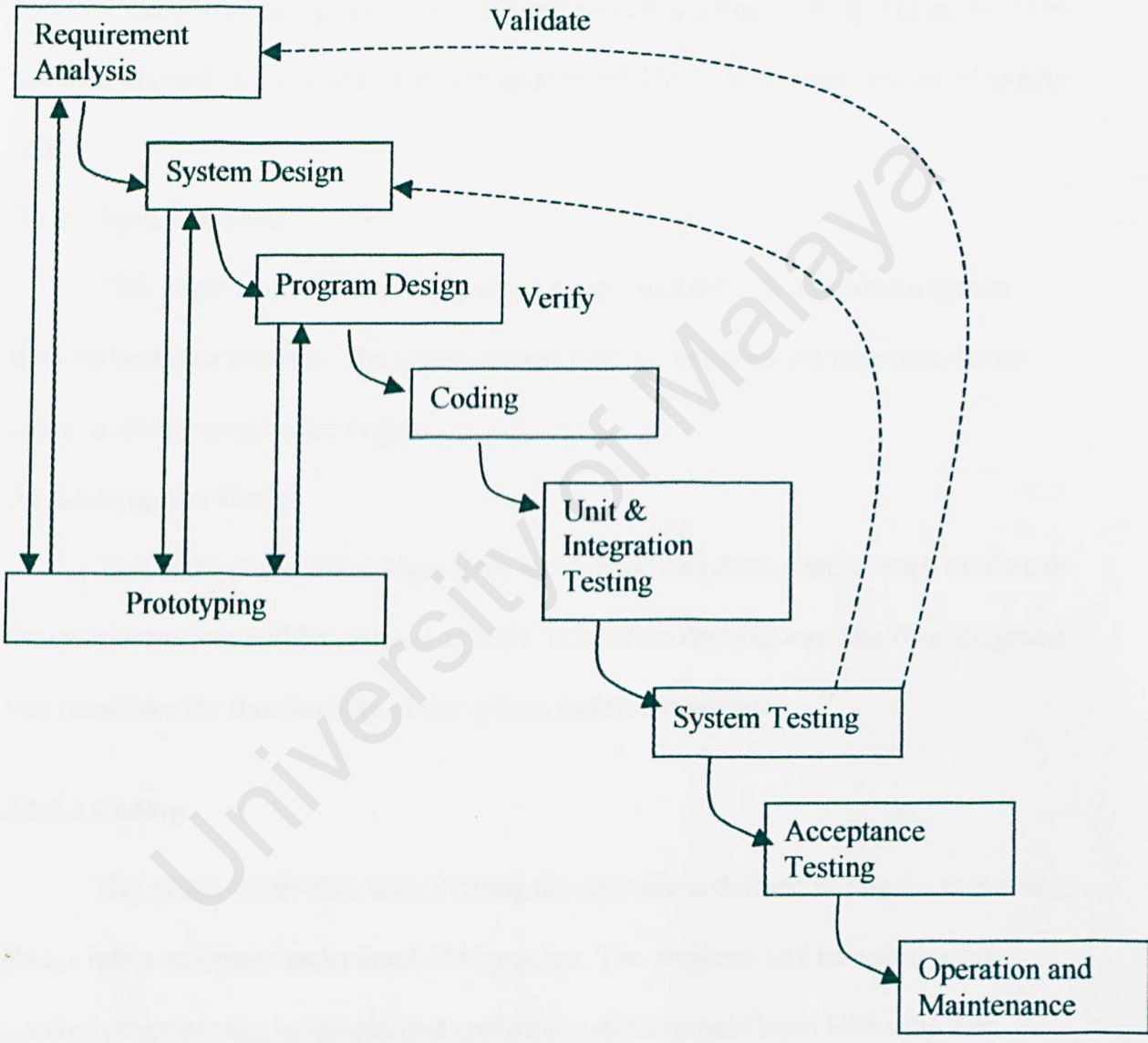


Figure 3.1: Waterfall Model With Prototyping

3.1.2.1 Requirement Analysis

This phase requires information gathering. It may be in technical aspect or non-technical aspect. Information will be gathered through the Internet, conduct interview and reading materials. The materials may include journals, magazines, books and newspaper. This is the phase where research and survey are done. The system's services, constrains and goals are established by consultation with system users. They are then defined in a manner, which is understandable by both users and development staff.

3.1.2.2 System Design

This phase is involved in designing a system and determining what a system does and not how it works. The system design process partitions the requirements to either hardware or software system.

3.1.2.3 Program Design

This is the phase where algorithms are defined and document for each module in the design tree that will be realized as code. It involves drafting out data flow diagrams that resembles the functionality of the system and its subsystem.

3.1.2.4 Coding

This phase involved in transforming the algorithms defined during the previous phases into a computer understandable language. The program will be coded using selected programming languages and application development tools following the design specification.

3.1.2.5 Unit Testing

The purpose of unit testing is to ensure that each module behave accordingly to its specification defined during program design phase. It checks each coded module for the presence of bug.

3.1.2.6 System Testing

This phase checks the entire system to ensure that the system behaves according to the software requirement specification.

3.1.2.7 Operational Maintenance

This phase continues defection and repair of bugs are carrying out.

3.2 Rationale for Proposed Methodology

3.2.1 Why Waterfall Model With Prototyping?

The Waterfall Model with Prototyping is chosen because Waterfall Model can suggest to the developer the sequence of events they should expected to encounter. It can be very useful in helping developers lay out what they need to do. Besides, developer also can estimate how close the project was to completion to give point of time. This model also enables developers to make necessary preparation for the coming phase.

Prototyping is used with waterfall model because it can help the developers to enhance their understanding about the system. In the prototyping section in waterfall model, the user requirement will be identified and documented. This information will be used to develop user interface and will be taken as prototype. Prototyping enable the users to interact with the system so that they have a better understanding what the new system will be. All the feedback from the users will be used to re-adapt the prototype in order to satisfy the users needs. The prototype is then used again and re-adapt until satisfy by the developers and users. The prototyping is added to waterfall model because the users do not know exactly what they want until they actually have a chance to see and work with the system or part of the system. Then, the system developers build system-using feedback supplied by the users.

The reason why the prototype is important to be integrated with the waterfall model is shown as below:

- Requirements are often poorly understood.
- Requirements usually change during the development process.

- Current requirements remain only partially understood until after users have an actual opportunity to use a system.

3.2.2 Why Not Waterfall Model?

Many problems will arise if we only use waterfall model alone. The biggest problem with the waterfall model is that it does not reflect the way code is really developed. Except for very well understood problems, software is usually developed with a great deal of iteration. Often, software is used in a solution to a problem that has never before been solved or whose solution must be upgraded to reflect some change in business climate or operating environment. The actual software development process, if uncontrolled, developers may thrash from one activity to the next and then back again, as they strive to gather knowledge about the problem and how the proposed solution addresses it.

Waterfall model shows how each major phase of development terminates in the production of some artifact (such as requirements, design, or code). There is no insight into how each activity transforms one artifact to another, such as requirements to design. Thus, the model provides no guidance to managers and developers on how to handle changes to products and activities that are likely to occur during development. For instance, when requirements change during coding activities, the waterfall model does not address the subsequent changes to design and code.

Curtis, Krasner, Shen and Iscoe (1987) note that the waterfall model's major shortcoming is its failure to treat software as a problem-solving process. The waterfall

model was derived from the hardware world, presenting a manufacturing view of software development. But manufacturing produces a particular item and reproduces it many times. Software is not developed like that; rather, it evolves as the problem becomes understood and the alternatives are evaluated. Thus, software is a creation process, not a manufacturing process. The waterfall model tells us nothing about the typical back-and forth activities that lead to creating a final product. In particular, creation usually involves trying a little of this or that, developing and evaluating prototypes, assessing the feasibility of requirements, contrasting several designs, learning from failure, and eventually settling on a satisfactory solution to the problem at hand.

3.2.3 Why Not Prototyping?

In the competitive world, every manufacturer wants to develop their products as fast as possible and want to promote that product before their competitors. Therefore, most of them use prototyping model. Prototyping is the technique of constructing a partial implementation of a system so that users or developers can learn more about a problem or solution to that problem. It causes the entire system to be constructed quickly

If a system is needed badly and welcomed readily, the prototype may be accepted in its unfinished state and pressed into service without the necessary refinements. While superficially, this may seem to be an appealing way to short cut the development effort, it works to the business' and team's disadvantage.

Besides, the manufacturer also does not considered the long-run maintenance. They always produce products that are difficult to maintain. However, they argue that when the problems arise in the future, the next release of the software that is more advanced had published to solve those problems. From this point of view, the manufacturer is blamed to be not responsible to the users.

Users will develop interaction patterns with the prototype system that are not compatible with what will actually occur with the complete system. Additionally, a prototype will not perform all necessary functions. Eventually, when users discover the deficiencies, user backlash may develop if the prototype has been mistakenly adopted and integrated into the business as if it were a complete system

All of the possible problems that project management is subject to are relevant here. It can be quite difficult to manage prototyping as a project within the larger systems effort. Although several iterations of the prototype may be necessary, extending the prototype indefinitely also creates problems. It is important that the system analysis team devises and then carries out a plan regarding how feedback on the prototype will be collected, analyzed and interpreted.

3.3 Requirements Analysis

3.3.1 Functional Requirements -

Functional requirements specify what actions a system design must provide in order to benefit the users of the system. The functional requirements for this System are: -

- The system must be able to validate the users login and password. Users should only able to view selected web pages, which they are authorized to view accordingly to categories the users are in.
- Members may join the mailing list. Any new information about the properties available or new project launches will be sent to all members available in the mailing list.
- Public users (whether they are members or not) can obtain information about properties by querying the database with the parameters such as property type, location, budget and so on.
- Create online database with information on properties, new housing projects, public auction tender, customer particulars, forms and legal documents, sales archive, tenancy information are available for viewing, searching and modification according to access granted. Reports can be automatically generate using preformatted templates for reference as well as statistical purpose.
- Database should allow updates, modification and deletions of selected tasks and web pages. The ability to perform these updates, modifications and

deletions should be specific to category of users allowed to do so. The system should not allow unauthorized users to perform these tasks.

- Each forms provided by the system must be validated before they are submitted to the database. Fields that are left out should be checked and if not filled the system should prompted to fill the left out fields. Restriction that has been imposed onto certain fields should also be checked. These restriction may be the numbers of characters accepted and types of characters accepted. This is important for fields such as the user ID, Password, Name, Telephone number, E-mail address and etc.
- Each users sessions should be abandoned when the users logs out of the system or closes the web browser. This is to prevent another user from accessing the system using the previous users access account.

3.3.2 Non Functional Requirements -

The non-functional requirements specify certain criteria, which the system must satisfy in order for the system to be more usable. These actions are not actual actions taken by the system but they are further restrictions on what the system must be able to handle.

The following are the non-functional requirements that are embedded into the proposed system: -

Integrity :

To provide a system that manipulates the data in a correct way as expected

Efficiency :

To provide user speed in page as well as information processing, to remove a screen from the memory once it is closed, abandon a user session once the user logs out of the system or closes the browser. These are mainly for security purpose aa well as to save resources in memory used.

Completeness :

The information presented to users must be in a form that is understandable and complete. User should not be in doubt or thinking "so what, how and why ….next?"

Accuracy :

The information displayed to various groups of users must be accurate and up-to-date to prevent any misrepresentations of the actual situation.

User-friendly :

This system should be easy to use by all the users as well as easily learnt by computer illiterate users. The system should provide helpful messages to help users to understand the system usage better.

Maintainability:

This system should be able to be changed or upgraded to a higher version as the user need evolve in the future. This means that new functions or modules can be added to the system in the future.

Security :

Since the system serves as an extranet to employees of real estate company, the system must protect the database which contains various information from unauthorized access,

modifications or deletions. This feature is important for the company to maintain its competitive edge in the market.

Reliability :

As the system is accessible to the public, management and system administrator around the clock, a failure or error of the system would impede the accessibility of the information. This may cause an inconvenience to the users or even financial lost to company. Therefore all possible error or failure must be taken into considerations and thorough test should be conducted to ensure that the system is reliable.

3.4 Feasibility Studies

Feasibility study is important before the requirements of a system can be gathered in order to make sure that the system being develop, meets the users requirements. This study is also to determine whether the system is feasible to be implemented and whether it can be implemented with the time and cost given. Several methods have been carried out to determine whether the on-line real estate system is feasible to be implemented or not, for example checking out the other similar existing applications.

Basically, all the features in this application already exist in other similar application. Also, interviews with few friends of my father who're related in this field and knowledgeable about real estate and were carried out to get some feedback on how the system should look like and its functions, and whether this system can be completed in the cost and time given. The conclusion made from this study was this site is feasible enough to be implemented.

3.5 System Requirement

3.5.1 Hardware Requirement for System Development

3.5.1.1 Hardware Requirement for Server

Component	Description
Microprocessor	Pentium MMX 166 MHz
RAM	At Least 16 MB
Storage	At Least 2 GB Hard Disk
Input Device	Mouse, Keyboard, Printer, Scanner
Video Monitor	EGA, VGA or Compatible Display

Table 3.1: Hardware Requirement For Development PC

3.5.1.2 Hardware Requirement for Client

Component	Description
Microprocessor	Pentium II 200 MHz or Higher
RAM	At Least 128 MB
Storage	At Least 2 GB Hard Disk
Input Device	Mouse, Keyboard
Video Monitor	EGA, VGA or Compatible Display
Internet Connection	At Least ISDN Line

Table 3.2: Hardware Requirement For Client PC

3.5.2 Software Requirement for System Development

3.5.2.1 Operating System

Windows 2000 Professional

Due to several advantages that are distinct when compared to other operating systems, Windows 2000 Professional was selected as the operating system in the project. The main reason for choosing this Windows is that Windows currently enjoys a dominant position as the preferred operating system by most corporations.

UNIX is extremely difficult to administer, even with attempts to make it friendly. It is based on several text files, which are often maintained manually. The formatting is critical software from operating NT Server, on the other hand, uses a Registry database. The graphical front end for managing the database interacts integrally with the operating system, making it easy to access and modify both user and system configurations.

UNIX has a native networking scheme called Network File System NFS, developed by Sun MicroSystem, allows the same sort of remote access to drives on servers on the PC redirector software. Although native to UNIX, NFS is quite foreign to the PC. NT Server does not suffer from this 'foreigner' status. NT Server is windows, from the interface to the networking and fits into a Windows network like a native. If no Windows access to NT Server is desirable, it can be accomplished through a third-party product.

UNIX systems are under constant attack by hackers. There is continuous Computer Emergency Team (CERT) alert warning of ways that various flavors of

UNIX are open to comprise. Furthermore, UNIX does not use encrypted passwords at login. Thus, a packet snifter on the network can read passwords in clear text — a real danger. NT Server has been certified as C2-secure, so it does not have the potential security holes of UNIX. NT Server can be used for secure government installations and has been widely adopted by financial firms instead of UNIX for security reasons.

3.5.2.2 Markup language

Hyper Text Markup Language (HTML)

HTML is a way of adding various attributes to plain text that are published on the World Wide Web. An HTML document is an ordinary text file. One of the key strength of HTML is that a document conforming to the HTML standard can be understood no matter what sort of software or computer the reader has. For example, someone using Netscape in Windows or someone using Lynx UNIX can interpret the same page.

HTML is the set of markup symbols or codes inserted in a file intended for display on a W.W.W. browser page. The markup tells the Web browser how to display a Web page's words and images for the user. Each individual markup code is referred to as an element (but many people refer it as a tag). Some elements come in pairs that indicate when some display effect is to begin and when it is to end.

HTML is a formal recommendation by the World Wide Web Consortium (W3C) and is generally adhered to by the major browsers, Microsoft's Internet Explorer and Netscape's Navigator, which also provides some additional non-standard codes. Both Internet Explorer and Netscape implement some features differently and provide non-

standard extensions. Web developers using the more advanced features of HTML 4 may have to design pages for both browsers and send out the appropriate version to a user. Normally, HTML files are 'interpreted' on the client side (in a user's web browser).

3.5.2.3 Technologies

Active Server Page (ASP)

An Active Server Page (ASP) is an HTML page that includes one or more scripts (small-embedded programs) that are processed on a Microsoft web server before the page is sent to the user. The code inside ASP is mixed with standard HTML and will not be seen by the browser. ASP pages run in all browsers unless the person making the page uses HTML or browser commands outside of the ASP portions.

ASP is a server-generated page that can call other programs to access databases, serve different pages to different browsers. Typically, the script in the web page at the server uses input received as the result of the user's request for the page to access data from a database and builds or customizes the page on the fly before sending it to the requestor. ASP is as efficient as writing code directly to server's application program interface.

ASP is an open, compile-free application environment in which HTML, scripts, and reusable ActiveX server components can be combined to create dynamic and powerful web-based business solutions. ASP has evolved into an 'open technology framework', means it is not necessary to use Microsoft products to create code in it. Nowadays, any language can be used to create ASP pages. ASP can also take advantage

of COM and DCOM (Component Object Model and Distributed Component Object Model) objects with minimum effort.

Any text editor can be used to create Asp code. Microsoft Visual Interdev will give nice highlights, wizards and pop-up boxes. With ASP, the code can be simply written in the HTML page. The HTML tags and the code are side by side. There is no compiling and complex interfacing. ASP has made it much quicker and easier to create highly interactive web sites. It also enables the pages easier for maintenance and updating in the future.

The output of an ASP file is plain HTML, the content of which can be customized for the capabilities of the client. We can capture all sorts of information that is not known at the time the instruction was written, for example, a user's input and profile, the time and location the user accesses the page, the type of browser and/or operating system that is running on the user's computer or the information contained in database, text files, etc. This HTML-generation instructions can be written in such a way that they use newly captured information to create up-to-minute, personalized, interactive web pages that serves fresh information every time they are requested. ASP allows you to define application and session variables that can be carried across multiple pages in a Web site.

ASP allows persistent connections between the client and server, the development of client server sessions, and the access and management of databases from the client side. They are not static pages, but rather they are dynamically produced from information stored in a database. Each time the database is updated, your Web site is updated. When you make a change or modification to the ASP file on the server, you

need to only save the changes to the file. The next time the Web page is loaded, the script will automatically be compiled.

ASP.NET

Active Server Pages (ASP) has long been the foundation for creating rich and dynamic Web sites using server-side scripting. With the Beta release of the .NET Framework, ASP has evolved into ASP.NET, and it now embodies many of the important key concepts behind the .NET Framework. In addition to being able to access any of the programmatic interfaces exposed by the .NET Framework, you can now construct server-side code using any of the languages that are compatible with the .NET Framework.

ASP.NET is a set of technologies in the Microsoft .NET Framework for building Web applications and XML Web Services. ASP.NET pages execute on the server and generate mark up such as HTML, WML or XML that is sent to a desktop or mobile browser. ASP.NET pages use a compiled, event-driven programming model that improves performance and enables the separation of application logic and user interface. ASP.NET pages and ASP.NET XML Web Services files contain server-side logic (as opposed to client side logic) written in Visual Basic .NET, C# .NET, or any .NET compatible language. Web applications and XML Web Services take advantage of the features of the common language runtime, such as type safety, inheritance, language interoperability, versioning, and integrated security.

3.5.2.4 Scripting Languages

JavaScript

JavaScript is an interpreted programming or script language from Netscape. In general, script languages are easier and faster to code in than the more structured and compiled languages such as C and C++. Script languages generally take longer to process than compiled languages, but are very useful for shorter programs. JavaScript is used in web site development to do such things as:

- Automatically change a formatted date on a web page
- Cause a linked-to page to appear in a popup window
- Cause text or graphic to change during a mouse rollover

JavaScript uses some of the same ideas in Java, the compiled object-oriented language derived from C++. JavaScript code can be imbedded in HTML pages and interpreted by web browser (or client). JavaScript can also be run at the server as in Microsoft's Active Server Page (ASP) before the page is sent to requestor. Both Microsoft and Netscape browsers support JavaScript, but sometimes in slightly different ways.

JavaScript gives developers the ability to do things such as check from contents, communicate with the user based on their actions, and modify the web page dynamically without the web page being re-loaded and without the use of Java, plug-ins or ActiveX controls. JavaScript also supports functions, again without any special declarative requirements. Functions can be properties of objects, executing as loosely typed methods.

VBScript

VBScript allows truly interactive Internet application to be constructed. HTML forms the basic design of a homepage, whereas VBScript adds interactively and performs validations on inputs keyed in by the user. The advantages of VBScript are:

- It can be written as a HTML file
- VBScript can be used to check variables in the input boxes. It verifies that all of the input boxes on a given form are filled and contain valid data ranges
- VBScript can also capture incoming e-mail addressed from the web site visitors.

The limitations of VBScript are:

- VBScript cannot write a file to web server's hard disk but uses another scripting language (ASP) to create interactive forms that append data to a file.
- No any compliant database. Data are stored in arrays to replace database files.

Visual Basic Scripting is a lightweight scripting language that provides programming functionality based on the Visual Basic programming language. It is natively executed on the Internet Explorer browser and can be executed in the browser through plug-in technologies. VBScript lets the user to interact with a web page rather than simply viewing it. VBScript can take input from the user and check the data to make sure it is valid or meets certain criteria. Then, it can put an Internet server to work either by actually storing the data or causing some action to take place on the server based on the information given. VBScript validates data, pricing, provides impressive multimedia feedback, and initiating data storage. The user can use VBScript to sequence the questions based on responses.

3.5.2.5 Web Application Development Tools

Macromedia Dream weaver

Macromedia Dream weaver is a designing tool used for creating a good web page with its special functions. There are three main categories to look at in this software that is design, code and develop.

In the design category, the latest version of it that is the macromedia Dream weaver MX, there are certain new features such as improve workspace layout, predefined sample page layouts and code, improved cascading style sheets (CSS) support and enhanced dream weaver templates.

The code category includes of a lot of new features such as coder-oriented workspace layout, code hints, snippets panel and tag editors. Where else the develop category comprises of ColdFusion MX support, ASP.Net support, PHP support and web services introspection.

3.5.2.6 Database

Microsoft Access

Microsoft Access 2000 is a Windows-based database management system, which runs under the Windows 95/98/2000/NT operating system. Access offers an easy-to-use database for managing and sharing data. It also adds increased integration with the Web for easier sharing of data across a variety of platforms and user levels. It enables sharing of database among the co-workers over the Internet, searching and retrieving the information quickly, and taking advantage of automated, pre-packaged solutions to quickly create databases.

Also, Stat/Transfer can be used to convert data between Microsoft Access and your favorite spreadsheet, database or statistical package. Besides that, data in Microsoft Access can be migrated to the Microsoft SQL Server.

Benefits of Microsoft Access:

- An easy-to-use tool for easily finding information that provides consistency and integration with the other applications in the office suite.
- Access 2000 allows easily sharing information via the corporate Intranet and the ability to easily host a database within the browser. User may create solutions that combine the easy-to-use of the Access interface (client) with the scalability and reliability of SQL server.

3.5.2.7 Web Browser

Web Browser is a client program (application) that is used to search through the information provided by a specific type of server. A browser helps you to view and navigate the information on the Internet. The creation of the browser made the Internet easier because the web-browser provides graphical, text-based terminal interface to the web-server. The web-browser translates client-requesting information sent by the web-server into a graphical user interface within the browser. It is also responsible in sending the request of the client in HTML form to the web-server.

Microsoft Internet Explorer 5.0 / 6.0

Currently, almost all the Internet users use either Netscape's browser or Microsoft's Internet Explorer browser or both. Although Netscape was initially the predominant product in terms of usability and number of users, Microsoft's browser is now considered superior by many users (although many other users see them as roughly equivalent) and has taken a slight lead in usage. Microsoft Internet Explorer (MSIE) is the graphical World Wide Web browser that is provided with the Microsoft Windows operating system. The MSIE browser competes closely with an earlier browser, Netscape Navigator. (As of December 2001, Internet Explorer was the dominant browser in terms of numbers of users and has apparently dominated the browser market.)

3.5.2.8 Web Server

Internet Information Server (IIS)

Internet Information Server (IIS) is a group of Internet servers (including a Web or Hypertext Transfer Protocol server and File Transfer Protocol server) with additional capabilities for Microsoft's Windows NT and Windows 2000 Server operating systems. IIS is Microsoft's entry to compete in the Internet server market that is also addressed by Apache, Sun Microsystems, O'Reilly, and others. With IIS, Microsoft includes a set of programs for building and administering Web sites, a search engine, and support for writing Web-based applications that access databases. Microsoft points out that IIS is tightly integrated with the Windows NT and 2000 server in a number of ways, resulting in a faster Web page serving.

A typical company that buys IIS can create pages for Web sites using Microsoft's FrontPage product (with its WYSIWYG user interface). Web developers can use Microsoft's Active Server Page (ASP) technology, which means that applications – including ActiveX controls – can be imbedded in Web pages that modify the content sent back to users. Developers can also write programs that filter requests and get the correct Web pages for different users by using Microsoft's Internet Server Application Program Interface (ISAPI). ASP and ISAPI programs run more efficiently than common gateway interface (CGI) and server-side include (SSI) programs, two of the current technologies.

Microsoft includes special capabilities for server administrators designed to appeal to Internet service provides (ISPs). It includes a single window (or 'console') from which all services and users can be administered. It's designed to be easy to add components as snap-ins that you didn't initially install. Individual customers can customize the administrative windows for access. IIS includes security features and promises that it is easy to install. It works closely with the Microsoft Transaction Server to access databases and provide control at the transaction level. It also works with Microsoft's Netshow in the delivery of streaming audio and video, delayed or live.

3.6 System Design

3.6.1 Data Flow Design

A data Flow Diagram is a graphic illustration that shows the data flow and logic within a system. In order to simplify and clarify what the data flow diagram is portraying, there are supplemental conventions as shown in the table below.

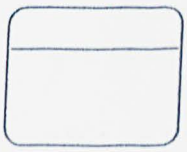
Symbol	Name	Description
	Source or destination of data	External sources or destinations of data. It interacts with system but is outside its boundary.
	Process	It represents the transformation or processing of information within a system
	Data Store	It is used for showing the data storage or referred by a process
	Data Flow	It is used to show the movement of data from an origin to a destination with the head of arrow pointing towards the destination.

Table 3.2: Symbols using Gane and Sardon Method

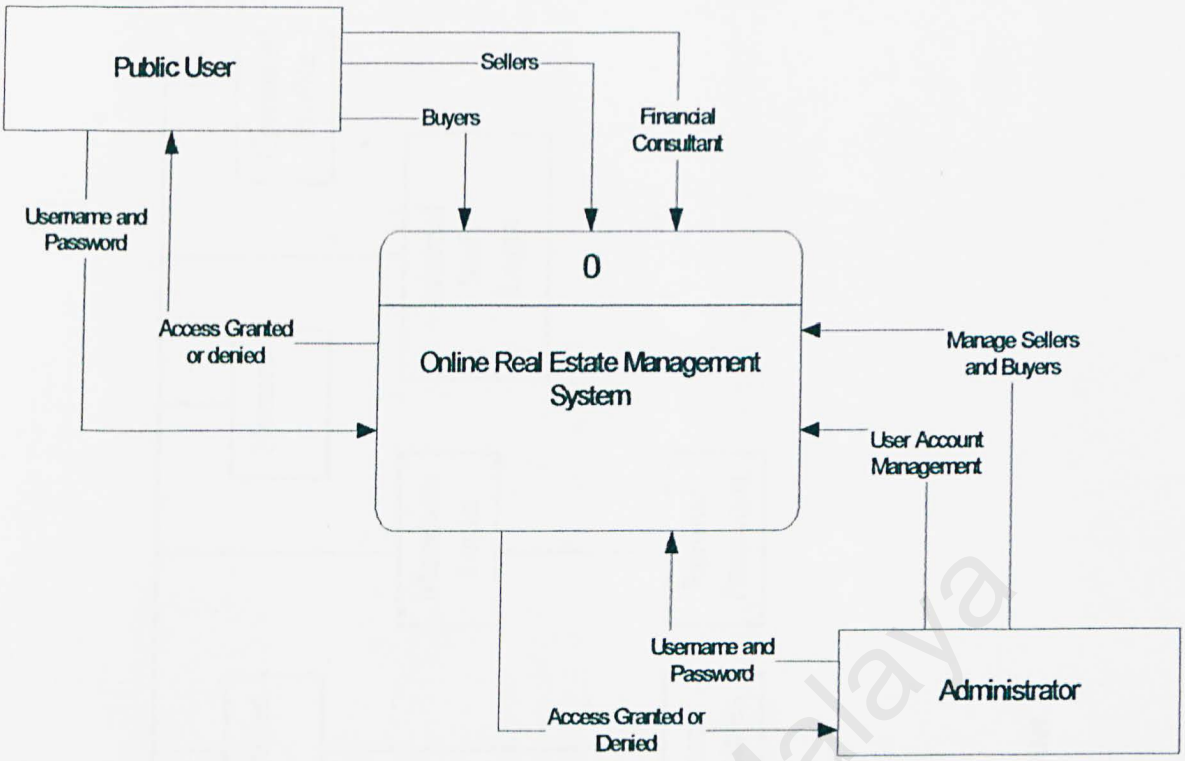


Figure 3.2: Context Diagram

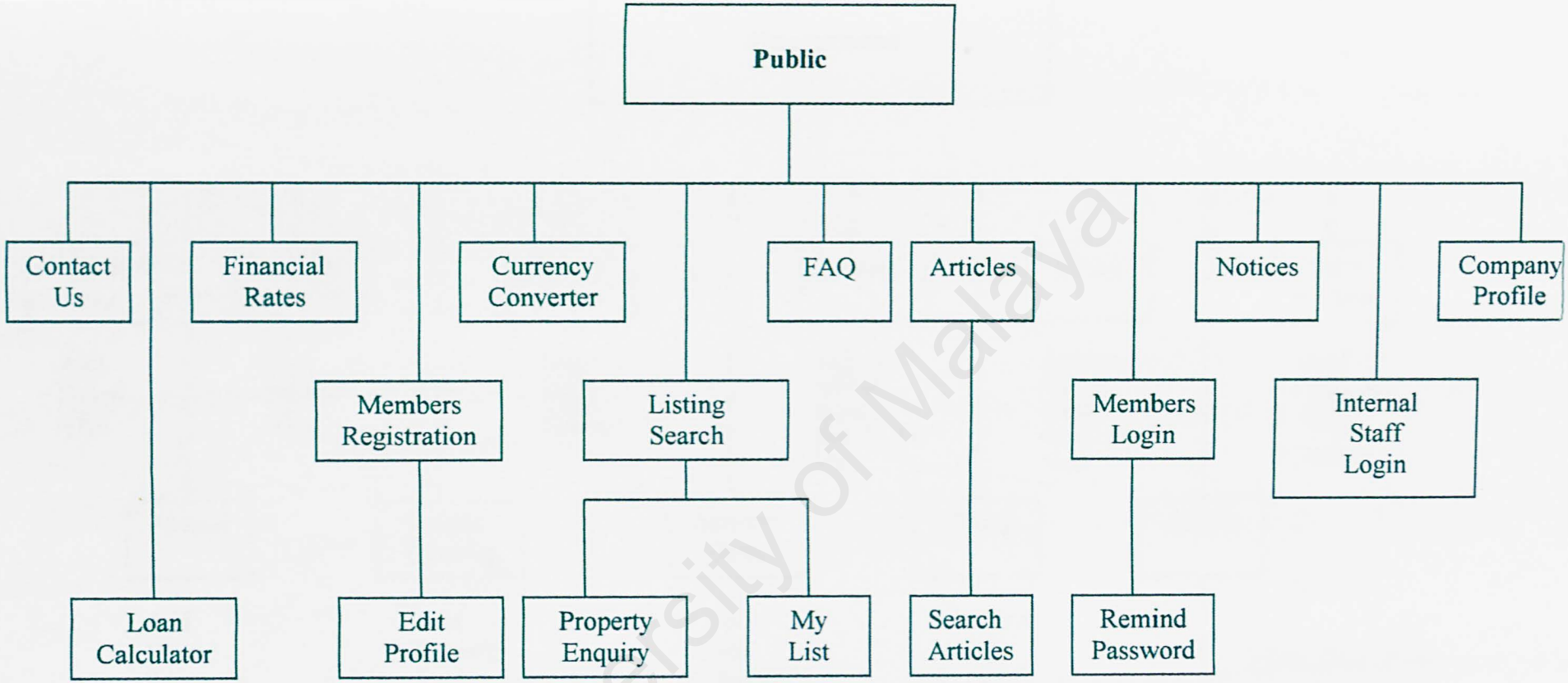


Figure 3.4 : System Architecture of Public Module

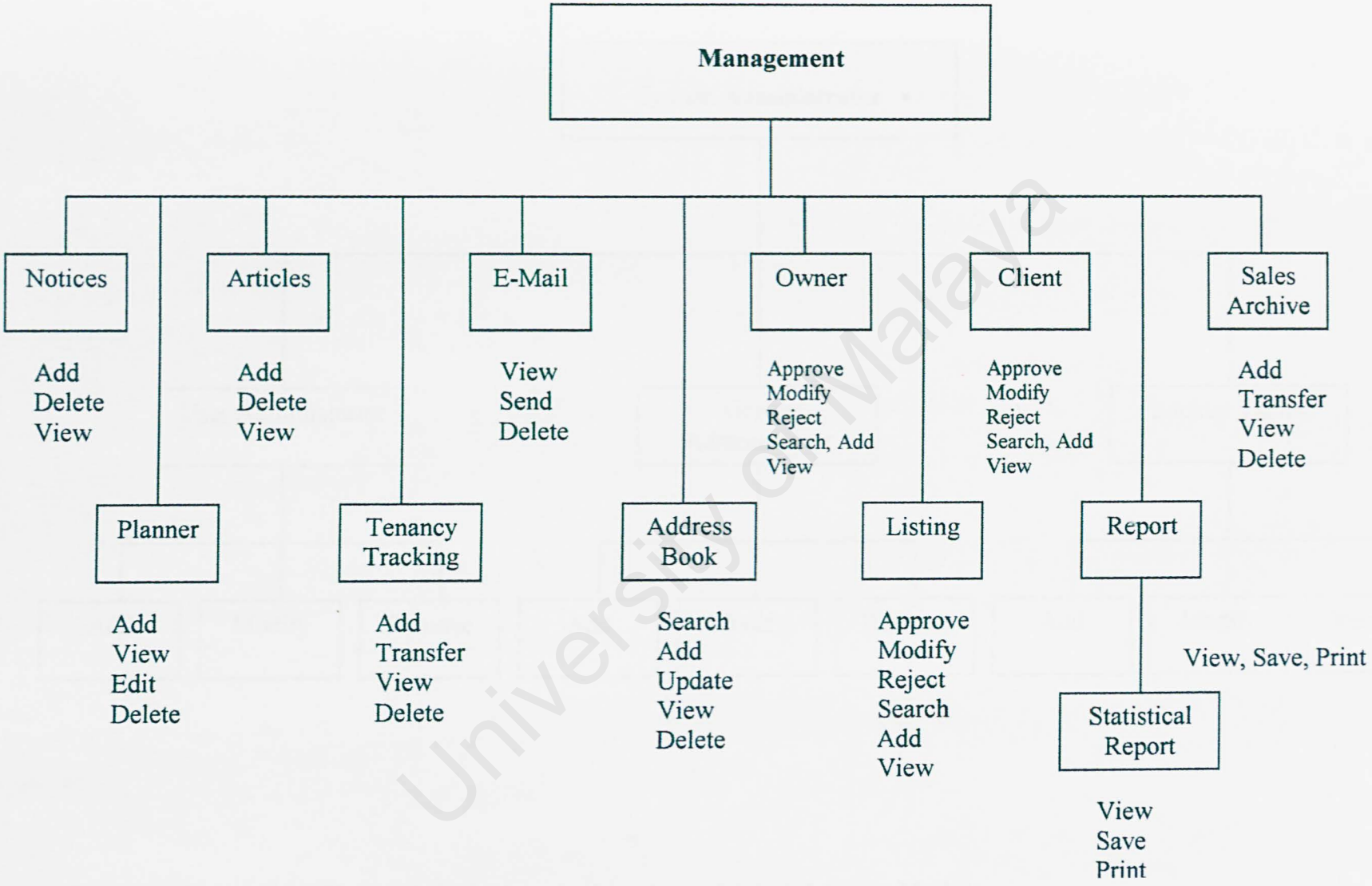


Figure 3.5 : System Architecture of Management Module

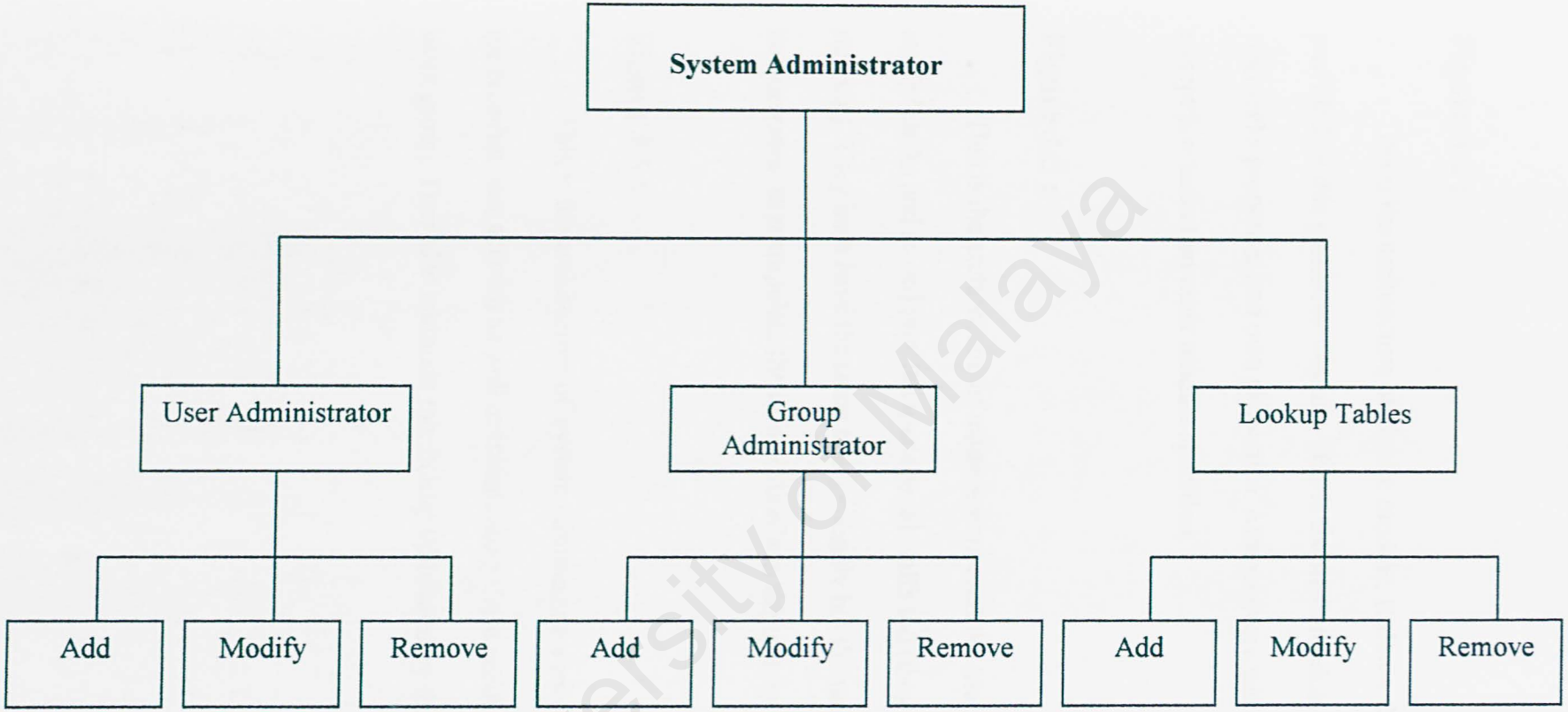


Figure 3.6 : System Architecture of Administrator Module

Figure 3.4 :

This is the architecture of public module. It shows the main functionalities provided by this particular module. This is the main module because they are the one who seeks properties and own properties. Almost every task in the system involve them except few tasks that other module specified.

Figure 3.5 :

This is the architecture of management module. Management involves normal staffs (clerks and so on) plus the managerial staffs too (they have the power of decision making). They both have the same task generally but the normal staff has limited authorization to manipulate the information's in the system.

Figure 3.6 :

This is the architecture of system administrator module. They are responsible for creating user account as well as maintaining these accounts and assigning users to work group. They also maintain the lookup table used by the system.

3.6.5 System Interface

Below is the initial design for the interface :

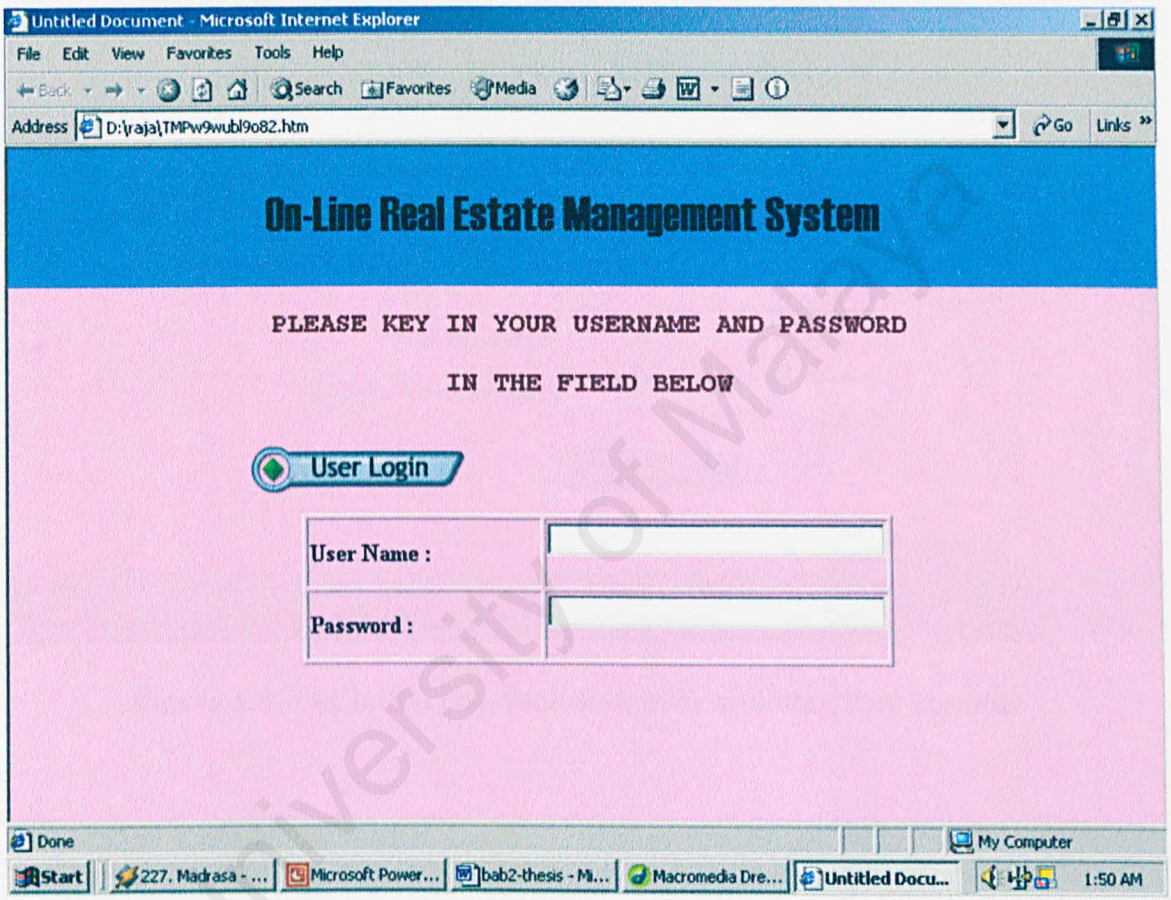


Figure 3.7: The initial interface design for login page

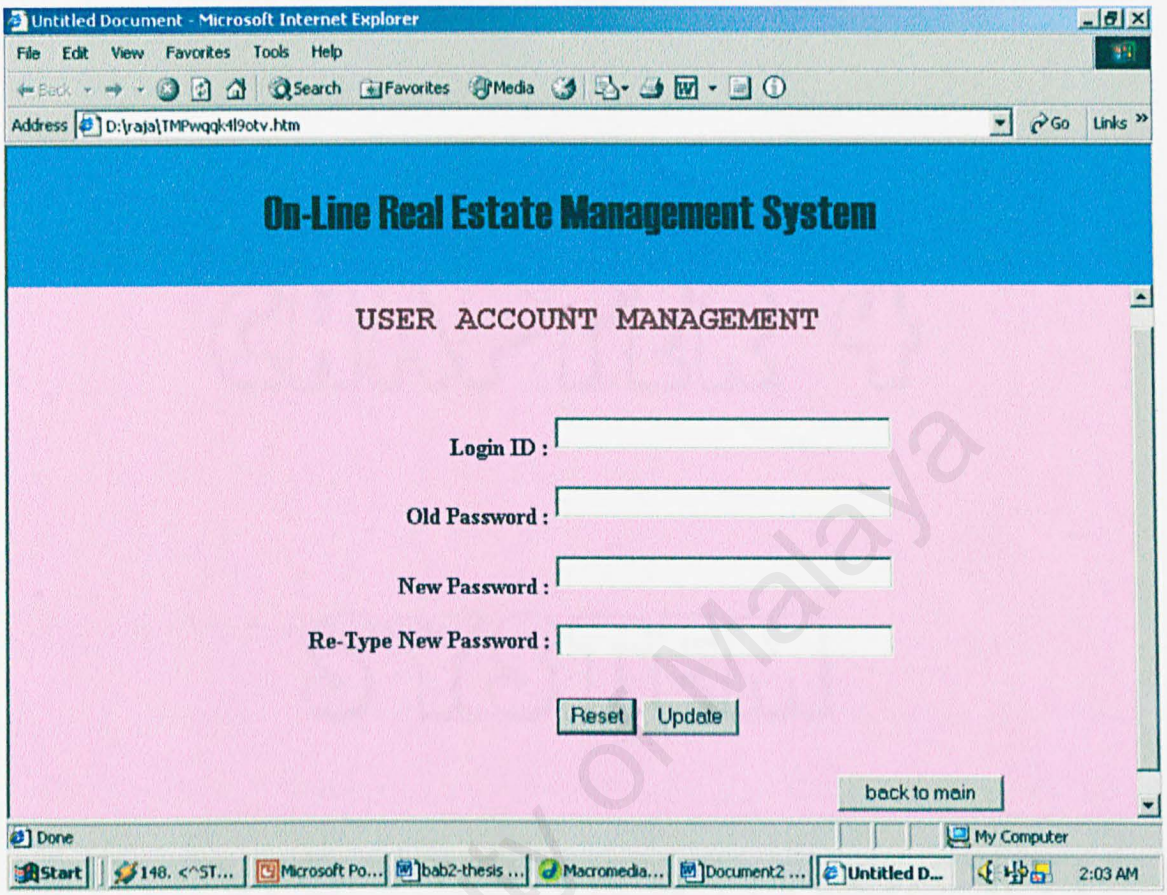


Figure 3.8: The initial interface design for updating user account

3.6.6 Expected Outcome

Upon completion to this project, it will become one of the useful for all the target user even for a laymen on real estate issues. This would be a very easy to use web based system (user friendly). Hope that it will emerge as one of the best KL land management web base system.

CHAPTER 4

SYSTEM IMPLIMENTATION

4.0 System Implementation

4.1 Introduction

System implementation in software development is a process to convert system requirements into program codes. This phase always involves some modifications to the previous design due to the limitations of the programming language used. The initial stage of system implementation involves setting up the development environment. This includes setting up development tools to facilitate the system implementation.

4.2 Development Environment

Development environment has certain impact on the development of a system. Using the suitable hardware and software will speed up the system development and it performance.

4.2.1 Hardware resource

From previous system proposal, system will be running in the networking environment, which is web – base system. So, to archive this objective, a proper hardware component should be chosen because this will determines the degree of successfulness of an implementation computerized system. The computer equipment will become the property of the users. This method is usually the most popular and advisable when the equipment is to be kept 5 years.

4.2.2 Software Resources

A computerized system will not be operated if there is not any software being installed and run in the computer system. There are basically three types of software for a computer system. They are system software (operating system), utility software and programming languages and application software.

Software	Purpose	Description
Microsoft Windows 2000	System requirement	Operating System
Internet Information Server	System Requirement	Web Server Host
Microsoft Access	Database	Build the data to store and manipulate the data
Macromedia Dreamweaver MX	User Interface Design	Design the web pages.
ASP	System Development	Coding the web pages
HTML	System Development	Coding the web pages
Internet Explorer	System Development	Viewing the web pages
Adobe Photoshop	User Interface Design	Image design and creation
Ulead Cool 3D 3.0	User Interface Design	Banner design and creation

Table 4.1: Summary of software/ software tools used for Online Real Estate

4.3 Program Development

Program development is the process of creating the programs needed to satisfy the system process requirements. It consists of 5 steps, which are review the program documents, design of the program, code the program, completion of the program documentation. Figure 6.1 shows the steps of the program development.

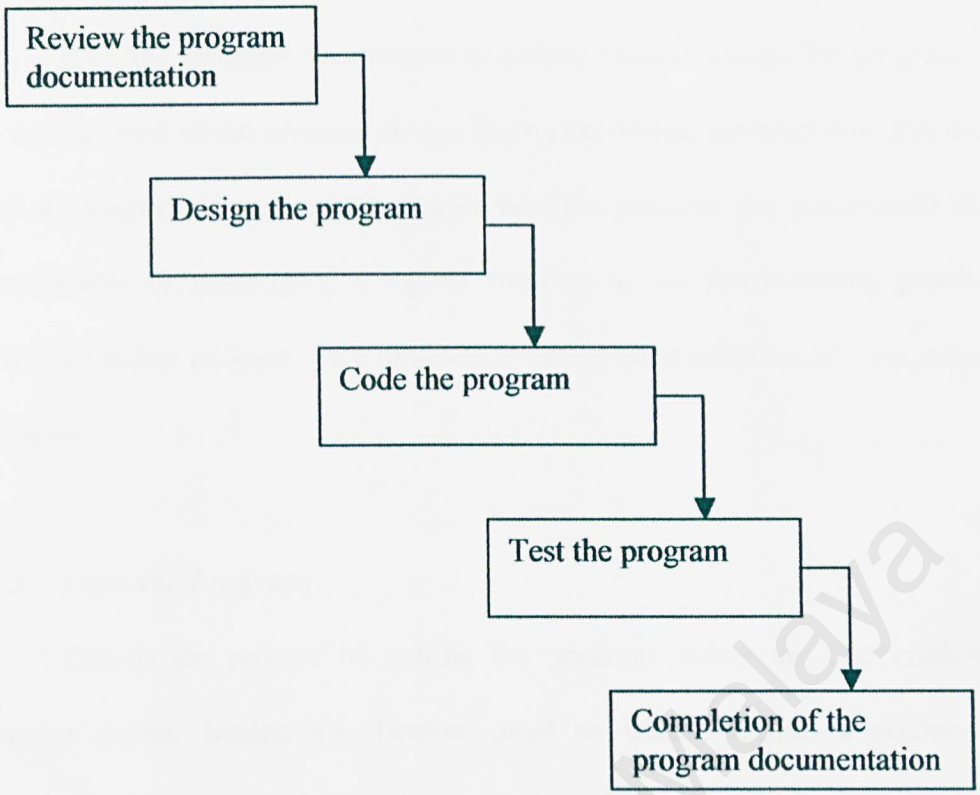


Figure 4.1: Steps of Program Development

4.3.1 Review the Program Documentation

The first step of the program development is to review the previous program documentation. The program documentation of the Online Real Estate consists of simple system description, system requirements and database design. This documentation helps to understand better the task that has to be covered during this coding phase.

4.3.2 Design the Program

After the program documentation review, need to design the program, which is the second level of the program design during the system development. For this second level of program design, have to decide how the program can accomplish the system requirements by developing a logical solution to the programming problems. The logical solutions, or logic, for a program is step-by-step solutions to most programming problems.

4.3.3 Code the Program

This is the process of writing the program instruction that implements the program design. Design specification must be translated into a machine-readable format. If design is performed in a detailed manner, coding can be accomplished mechanically.

4.3.4 Test the Program

This process is to ensure the system function by testing the program thoroughly. Testing is a must before the program processes actual data and produces information on which people will rely. I will perform several types of test on an individual program, which will be discussed further in the following chapter.

4.4 Program Coding

4.4.1 Coding Principles

Throughout the coding phase for the system, several principles are followed in order to ensure the quality and the structure of the generated code. They are as follows:

1. **Readability**

   Easy to read codes are essential for the future system enhancement by another developer. To cater for this, meaningful variables and label names have been used. Comments are written in most of the coding pages to explain their every functionality. Proper indentations are followed to enhance readability.

2. **Maintainability**

   Codes should be easily read, corrected and revised. To achieve this, codes should be readable (as explained above), highly cohesive and loosely coupled. A code that performs functions for one module should be grouped together and tries our best as much as possible to achieve high cohesive and loose coupling.

3. **Robustness**

   Codes should be robust in terms of handling errors and responding by displaying appropriate error messages and try to avoid system failure.

4.4.2 Coding Methodology

In the coding phase, two approaches have been used, which are the top-down and the bottom-up approach. Both of the approaches are used to obtain the benefits from them.

1. Top-Down Approach

This approach starts by looking at the large picture of the system and then exploding to smaller parts or subsystem. Top-Down approach allows the higher-level modules to be coded first before the lower level modules.

This method ensures that the important or core modules of the system to be developed and tested first. Deploying the methods gives a preliminary version of the system sooner. The advantages of using this approach are as follows:

- Prevents the developer from getting so mixed in the detail that they loose track of what the system is suppose to do.
- Avoiding the chaos of attempting to code a system all at once
- This method is compatible with the general system thinking of normal human nature.

2. Bottom-Up Approach

In contrast with the top-down approach, the bottom-up approach starts coding at the lower level modules before the higher-level modules. The higher-level module acts as an empty shell that calls these lower level modules. The completed lower level module will then be integrated with the newly completed higher-level module.

4.4.3 Database Implementation

For Online Real Estate, the database is stored in a PC in which Microsoft Access is installed. Any data creation, updates or data retrieval will be connected directly to the

database server through ADOBD connection. The database includes tables to keep user details including user registration, property info, transaction info.

After the Online Real Estate is completed and tested successfully, all the data were flush from the database. All the unnecessary tables were eliminated from Online Real Estate database to avoid data overlapping and to reduce workload of the entire system when deployment.

4.5 ASP Coding

```
<%
if Session("UserId")="" then
  Response.Redirect("login.html")
  end if
 %>

<html>
<head>
<body>
 <table width="100%">
    <tr>
            <td align=right bgcolor=cyen>
                        <B> Date :<%= Now %> </B>
                </td>
        </tr>
 </table>
 <table width="95%" border="0" align="center" cellpadding="0" cellspacing="0">
  <tr>
    <td width="100%" colspan="2"><table width="100%" border="0"
cellspacing="0" cellpadding="0">
       <tr>
         <td width="50%"> </td>
         <td width="50%" valign="bottom"> </td>
       </tr>
     </table></td>
```

Table 4.2 : Session Identification

```
<%
set conn=server.CreateObject("ADODB.Connection")
str="Provider=Microsoft.Jet.OLEDB.4.0;Data
Source=C:\Inetpub\wwwroot\RealEstate\RealEstate_Local\RealEstate.mdb;Persist
Security Info=False"
conn.ConnectionString = str
conn.Open

%>
```

Table 4.3 : Database Connection

```
<title>Online Real Estate</title></head>
        <script language="javascript">
                function trim(text)
                {
                        if(text=="")
                                return 0;
                        for(var i=0;i<text.length;i++)
                        {
                                if(!(text.substr(i,1)==" "))
                                        return 1;
                        }
                        return 0;}
                function check()
                {
                        var userid=window.document.form_login.userid.value;
                        var password=window.document.form_login.password.value;
                        if((trim(userid)==0)||(trim(password)==0))
                        {
                                alert("User ID and Password should not be empty");
                                return false;
                        }}
                function check1()
                {
                        var userid=window.document.form_MailPassword.userid.value;

                        if((trim(userid)==0))
                        {
                                alert("User ID should not be empty ");
                                return false;}}
        </script>
```

Table 4.4 : Login Validation

```
<script language="javascript">
		function trim(text)
		{
			if(text=="")
				return 0;
			for(var i=0;i<text.length;i++)
			{
				if(!(text.substr(i,1)==" "))
					return 1;
			}
			return 0;

		}
		function check()
		{

			var
firstname=window.document.form_Registration.firstname.value;
			var emailid=window.document.form_Registration.emailid.value;
			if((trim(firstname)==0)||(trim(emailid)==0))
			{
				alert("No mandatory fields can be empty");
				return false;
			}
			if((emailid.indexOf("@")==-1)||(emailid.indexOf(".")==-1))
			{
				alert("The E-mail Id is not valid");
				return false;
			}

		}
	</script>
```

Table 4.5 : Password Varification

```
<td width="71%" align="left"> <textarea name="information" cols="50%"
rows="6"><%= rs.Fields(7) %></textarea></td>
                        </tr>

                        <tr align="center"> <%=Request.Form("userId")%>
                          <td colspan="2" height="30">

                          <form action ="AuctionRequest.asp" method="post"
id=form1 name=form1>
                          <input type=hidden name="userId"
value="<%=Request.Form("userId")%>" >

<input type=hidden name="price" value="<%= rs.Fields(6)%>" >

                           <input type=hidden name="pid"
value="<%=Request.Form("radiobutton")%>" >
<input type="submit" name="ASubmit" value="Request for Auction">
<input type=button value=Back onClick="window.history.back()" id=button1
name=button1></form>
```

Table 4.6 : Auction

```
<script language="javascript">
            function trim(text)
            {
                  if(text=="")
                        return 0;
                  for(var i=0;i<text.length;i++)
                  {
                        if(!(text.substr(i,1)==" "))
                              return 1;}
                  return 0;
}
            function check()
            {
                  var cost=window.document.form_Registration.cost.value;
                  var
card_name=window.document.form_Registration.card_name.value;
                  var
card_number=window.document.form_Registration.card_number.value;
            var exp_mnth=window.document.form_Registration.exp_mnth.value;
            var exp_year=window.document.form_Registration.exp_year.value;
                  if((trim(cost)==0)||(trim(card_name)==0)||(trim(exp_mnth)==0)
||(trim(exp_year)==0)||(trim(card_number)==0)){
alert("No mandatory fields can be empty");
return false;}
```

Table 4.7: Credit card validation

```
<TABLE cellSpacing=0 cellPadding=0 width=330 border=0>
        <TBODY>
        <TR>
          <TD>Monthly Gross Income</TD>
          <TD>RM</TD>
          <TD><INPUT class=formField style="WIDTH: 117px" maxLength=20
            size=12 name=in1></TD></TR>
        <TR>
          <TD colSpan=3><IMG height=5 alt=""
            src="images/spacer.gif" width=1
            border=0></TD></TR>
        <TR>
          <TD>Additional Monthly Income</TD>
          <TD>RM</TD>
          <TD><INPUT class=formField style="WIDTH: 117px" maxLength=20
            size=12 name=in2></TD></TR>
        <TR>
          <TD colSpan=3><IMG height=5 alt=""
            src="images/spacer.gif" width=1
            border=0></TD></TR>
        <TR>
          <TD>Monthly Debt<BR><SPAN class=smallerType>(including student
            loans, auto loans, personal loans and total minimum due on
            credit card with balance; not including current home
            expenses)<BR></SPAN></TD>
          <TD vAlign=top>
            <DIV style="MARGIN-TOP: 2px; MARGIN-LEFT:
0px">RM</DIV></TD>
          <TD vAlign=top><INPUT class=formField style="WIDTH: 117px"
            maxLength=20 size=12 name=in3></TD></TR>
        <TR>
          <TD colSpan=3><IMG height=10 alt=""
            src="images/spacer.gif" width=1
            border=0></TD></TR>
        <TR>
          <TD>Expected Down Payment</TD>
          <TD>RM</TD>
          <TD><INPUT class=formField style="WIDTH: 117px" maxLength=20
            size=12 name=in4></TD></TR>
        <TR>
```

```
<TD colSpan=3><IMG height=5 alt=""
            src="images/spacer.gif" width=1
            border=0></TD></TR>
          <TR>
           <TD>Loan Term</TD>
           <TD><IMG height=1 alt=""
            src="images/spacer.gif" width=1
            border=0></TD>
           <TD><SELECT class=formField name=in8> <OPTION value=15
             selected>15
             years       </OPTION>
             <OPTION value=20>20 years</OPTION> <OPTION value=30>30
             years</OPTION> <OPTION value=40>40
years</OPTION></SELECT>
          </TD></TR>
          <TR>
           <TD colSpan=3><IMG height=5 alt=""
            src="images/spacer.gif" width=1
            border=0></TD></TR>
          <TR>
           <TD>Interest Rate</TD>
           <TD><IMG height=1 alt=""
            src="images/spacer.gif" width=1
            border=0></TD>
           <TD>
            <TABLE cellSpacing=0 cellPadding=0 border=0>
             <TBODY>
             <TR>
              <TD><INPUT class=formField style="WIDTH: 107px"
               maxLength=25 size=10 name=in9></TD>
              <TD> %</TD></TR></TBODY></TABLE></TD></TR>
              <br> </td>
          <TR>
           <TD colSpan=3><IMG height=15 alt=""
            src="images/spacer.gif" width=1
            border=0></TD></TR>
          <TR>
           <TD vAlign=top>
            <DIV style="MARGIN-TOP: 9px; MARGIN-LEFT: 2px">
                              <IMG height=1
            alt=""
            src="images/learn-hr-calculator.gif"
            width=191 border=0><BR></DIV></TD>
```

Table 4.8 : Financial Consultant

CHAPTER 5

SYSTEM TESTING

5.0 System Testing

5.1 Introduction

The main function of testing is to establish the presence of defect in a program. Meanwhile, testing is used to judge whether or not the program is usable in practice. Nevertheless, testing can only demonstrate the presence of error. It cannot show that there is no error in the program. Therefore, suitable approach must be chosen to reduce the possibility or error in a program. Several rules serve well as program testing objectives.

a) Testing is a process of program execution with explicit intents to find errors and run-time program bugs.

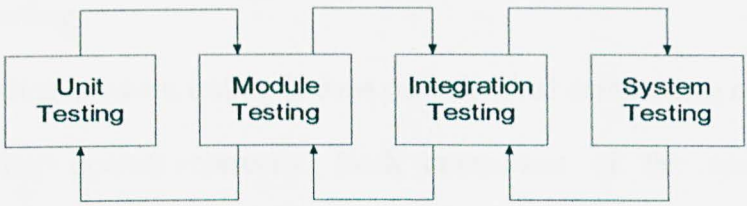
b) An effective test case is one that contains unexpected testing record sets with high probability of detecting undiscovered errors during the program design and development phase.

c) A successful test is also not one that uncovers only few expected error, but it is which constantly provides new challenges to its programmers over time.

The different between testing modules during the development phase and testing them during software integration is that error can be fixed as they are found the integration phase must be recorded and the bugged module must be returned to its development team or programmers for further correction based on its errors logs. Online Real Estate Management System has gone through three stages of testing before it is completed. These three stages are the component testing, integration testing and acceptance testing.

5.2 Testing Process

In general, the testing process of the system can be shown in the following figure.



Testing Process

The testing procedure will be started from component testing to ensure the codes implemented in the system will properly fit the system requirements. This is follow by the integration testing, which is tested for the overall functionality and performance of a few modules that are integrated together. Lastly, the testing procedure, user is required to test the system carefully to ensure that the implemented system will function according to their requirements. If any mistake or defects are discovered at any stage, the previous stages might need to be repeated for correction and modification.

5.3 Testing Approach

The testing approach adopted in this system is the bottom-up approach. Using this approach, each module at the lowest level of the system hierarchy is tested individually. Then, the next module to be tested is that module that calls the previously tested module. This approach is followed repeatedly until all modules have been tested.

5.4 Component Testing

The details of how each stage takes place in Online Real Estate Management System are described in the following sections.

5.4.1 Unit Testing

Unit testing is where testing is done on individual components of the system to ensure that they operate correctly. Each component of the system is tested independently, without other system components. Unit test is very time-consuming and labor intensive stage of any software development. Several techniques have been used in the unit testing for the Online Real Estate Management System: -

5.4.1.1 Code Review

Before the function is run in the browser, codes are reviewed line by line to discover any syntax error as well as semantic error. If errors are discovered, they are corrected immediately.

5.4.1.2 Code Differ In Colour

By using the Macromedia Dreamweaver MX, the code will be in different color. For instance, JavaScript codes will be in red color and ASP codes will be in grey. If the code contains errors, it will appear in bright yellow.

5.5 Module Testing

Module testing is implemented after the unit testing stage to uncover error in each unit. A module is a collection of dependent components. During this stage, all the related units or functions will be integrated and tested in the module level. In

performing module test, different test cases are applied to the module and the test results are recorded. If errors occur in this level, each unit will be retested till there is a solution to the problem. This is done because although each sub module performs its task correctly, the end result produced may be incorrect when all the sub modules work together.

5.6 Integration Testing

5.6.1 Sub-System Testing

The sub-system testing is done after the module testing whereby the entire module would be integrated and tested further. The sub-system testing is done to check the functionality of the integrated modules. The most common problems that arise when modules are integrated together are module interface mismatch. Therefore, the main concern in integration test is to exercise the interface repeated to defect any interface mismatch problem. Several important aspects are checked to reduce the possibility of interface problem as listed below:

- The necessity to perform a checking that redirects the user to the correct module
- Whether the type of parameter tallies with the type of parameter received
- Whether information passed is sufficient for the receiving module to perform its task
- The necessity of the type conversion.

5.7 System Testing

The system testing process is concerned with finding errors, which result from anticipated interactions between sub-systems and system components. It is also concerned with validating that the system fulfills the functional and non-functional requirements. System testing can be categorized into a few types: -

5.7.1 Stress Testing

This is to determine that the program fulfills the requirements defined for it. It is equally important to ensure that the program works, as it should under extreme conditions. In order to perform stress testing, execute the system in a manner that demands resources in abnormal quantity, frequency, or volume.

5.7.2 Performance Testing

For real-time and embedded systems, software that provides required function but does not conform to performance requirements is unacceptable. Performance testing is designed to test the run-time performance of software within the context of an integrated system. Performance testing occurs throughout all steps in the testing process.

5.8 User Testing

User testing or acceptance testing is the final testing procedure in the Online Real Estate Management System whereby users will be actively involved in testing system to ensure that the system meets their requirements. The main purpose of this testing is to verify whether the system has fulfilled the user's requirements. Besides

that, the functionality of the system is demonstrated to the end users and the users are given the chance to experience and explore the system themselves.

Some of the comments that are given by user are as below:

- The system is easy to understand and have a short learning curve.
- The user interface is nice but can do some enhancement to it to give a more user friendly look.
- More faster auction function should be better
- More types of Services can be prepared in this system.

5.9 Analysis of test Results

From the all testing process that has been carry out, the test results can be summarized as follow:

- Achieving the main objectives of the project.

  Generally the main objectives of the project as described in Chapter 1 have been achieved. The system can maintain all the inventory transactions. This is an important and major activity in an organization.

- Enhancement on the user interfaces

  The user interface for the system should be more attractive and user-friendly in order to attract the user to use the system. So using more graphics and attractive icon to represent the buttons may help t improve.

5.10 Conclusion

At the end of the testing phase, the system should be able to perform the task required and free of most errors. The user should use the system. However, there are still some critical problems and errors, which would occur only after using the system for some time. Therefore, work of testing should not just end in this phase but have to done every now and then to make sure the system functions well.

CHAPTER 6

SYSTEM EVALUATION

6.0 System Evaluation

6.1 Introduction

Evaluation is the ultimate phase of developing a system and an important phase before delivery the system to the end users. Evaluation was related to user environment, attitudes, information priorities and several other concerns that are to be considered carefully before effectiveness can be concluded. At all phases of the system approaches, evaluation is a process that occurs continuously, drawing on a variety of sources and information.

6.2 Problems Encountered and its Solutions

6.2.1 Problems In Tools and language Selection

Since developing an Online Real Estate Management System is a new technology, it is difficult in selecting the most appropriate tools and software for the development of Online Real Estate Management System in the beginning stage. It is because the process of choosing the suitable technology and tools for project development is a very critical process as different tools has its strength and weaknesses.

Hence, to learn more information in web-based application in the system, in depth studies and research on the programming language and tools using were conducted in the earlier stage of the development. The studies and research activities including Internet surfing, reference books, review the current systems in the market and others.

6.2.2 Difficulties In Determining System Scope

Without experience in web-based development, it is difficult to define the scope of the system in the early stage. Due to the insufficient knowledge and time constraint, it is impossible to built a full-scale complete system within the given time frame.

To solve this problem, reference and analysis on current web sites has been conducted in order to understand the system design of each web site and try to adopt some of the ideas into the system design of Online Real Estate Management System.

6.2.3 Lack of Knowledge In the Language and Tools Chosen

Due to the time constraint, it is very difficult in learning the chosen language and tools. Without a strong base of the language, I need more time in looking for solution to solve technical and non-technical problems that were encountered during the development of Online Real Estate Management System. It consumes a lot of time in the beginning stage of development to learn the new programming language. All these need some research on the component before knowing how to use the component and how to apply it in the modules. To solve these problems, Internet was the most vital source. There are lots of source codes and free tutorials in the World Wide Web.

6.2.4 Slow System Response Time

There are some modules in this system especially those are connected to database need to be able to response in the minimum amount of time.

6.3 Evaluation By The End User

As Online Real Estate Management System is proposed to produce a more efficient and effective property management, the final stage of system development which is the system testing becomes critical and it needs feedbacks from all respective users in judging the correctness of these functionalities, precise data flow as well as enhance interface of the system.

Anyway, as the scope of Online Real Estate Management System is large, development was conducted with the objective to cover the scope briefly, which means that the whole system was developed quickly to have the overall structure and potential of the system but the system was not refined to show its full efficiency.

The overall feedback from the end users is good and Online Real Estate Management System is expected to serve the targeted group well after refining.

6.4 System Strengths

6.4.1 Simplicity of User Interface

By employing the graphical user interface, Online Real Estate Management System can be evaluated as an easy-to-use system. Unlike those command-based environment, Online Real Estate Management System is more user friendly to interact with sufficient instruction and guidelines are provided to assist users. Users are required only minimum typing and inputs when they interact with the system.

6.4.2 Efficiency of the System

The system administrator module developed is a user-friendly and efficient program. The administrator can easily add new records, update and delete existing records in their respective fields.

6.4.3 Error Messaging

In this system, the error message will display immediately when an error occurs. This allows users to identify their errors effectively. For examples; when a required field is not entered during and updating session to the records, the system will notify the particular user about this.

6.4.4 Consistency

All the pages are designed in a way that all the links are arranged in the same position although the user switches from one page to the other. This allows the user to perform better while using the system.

6.4.5 System Transparency

System transparency refers to the condition where the user does not need to know where the database resides, how is the system structure or anything related to how the system was built. This is important because without transparency, confused user might lead to the destruction of the system.

6.4.6 Maintainability

The system is saved in files, thus making it relatively easy to maintain. All the classes and objects are coded in a standardized form to ensure the readability, which eventually will increase maintainability.

6.5 System Weakness

6.5.1 Lack of Security Features

Encryption and the security of the login module are still considered as a hazard for the system to be implemented. Better encryption techniques and security policy should be implemented in the future.

6.5.2 Platform and Browser Limitations During The Implementation Phase

The Online Real Estate Management System implementation depends heavily on the use of Microsoft Technology. The current implementation of the Online Real Estate Management System is limited to the Windows 2000 and XP Operating System and Internet Explorer 5.0 as client browser. Due to constrain of time and technical knowledge, they system cannot perform properly under other operating system, such as Linux.

6.5.3 Very Limited Reporting Function

The available reporting module that is very limited in function. It has to load all the record in to the data grid in the browser first before users can print them. If too many records are to be shown, then the downloading time will extend and memory from the client side will be exhausted. Third party software should be sought to ensure a more efficient reporting module to handle large amount of data.

6.5.4 Lack of Functional Modules

The available functional module in the system is very limited. This is because of the lack of knowledge and experience in the handling of a web-based online real estate management system.

6.5.5 User Cannot and Retrieve Password Through The Internet

This limitation is actually trade off for the security of the system. This is caused by the central maintenance of the login module by the administrator to control the users.

6.6 Future Enhancements

System development is a very dynamic process that requires the developer to consistently checking on the system to ensure that it is running smoothly. The system was developed under three months that does not allow the developer to implements all the new ideas that come about during the implementation stage. Below are some of the enhancements that the developers wish to implement in the future;

- Implement password encryption to increase the security of the session
- Enhance the reporting module to be able to have more function
- Administrator should be able to backup the database through the system
- Automatically notify users who are just added to the system through mail.

6.7 Conclusion

The lure of greater efficiency, lowered costs and higher quality drive must of an organization to gain competitive edge in business from the knowledge of Information Technology. Online Real Estate Management System is a start to computerize the operations/ transactions in the business organizations towards the effort of paperless concept.

A lot of knowledge was gained throughout the literature review, requirements analysis and the initial system development of the project. Information gathered through

various sources is extra knowledge for me that cannot be obtained from the courses taught in faculty. Adherence to a development schedule is very important in order to get a job done on time. This experience will definitely prove useful in future system development.

Overall, the Online Real Estate Management System has achieved and fulfilled the objectives and requirements of a web based real estate system as stated in the project proposal. The use of web based approach brings along many benefits including the ability to access information anywhere and at anytime of the day. Administrator can perform administering tasks online anywhere at anytime. This will ease the administrator to expand the business throughout the whole Malaysia. This also meets the university's objective in bringing education to the public throughput the nation and also expanding its facility.

Finally, there are still many rooms for the improvement in the Online Real Estate Management System, in terms of implementing a comprehensive and complete inventory system. With the initial step taken, enhancements could be made by inserting more features when implementing the system in the time to come. It is hoped that this system will be a success and provides a foundation upon which more innovative and comprehensive system may be built to perform multiple tasks and fulfill various user requirements.

References

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Appendix A

Schedule of Project

To achieve the project objectives, a project schedule is planned to manage the time for the tasks that is needed to complete.

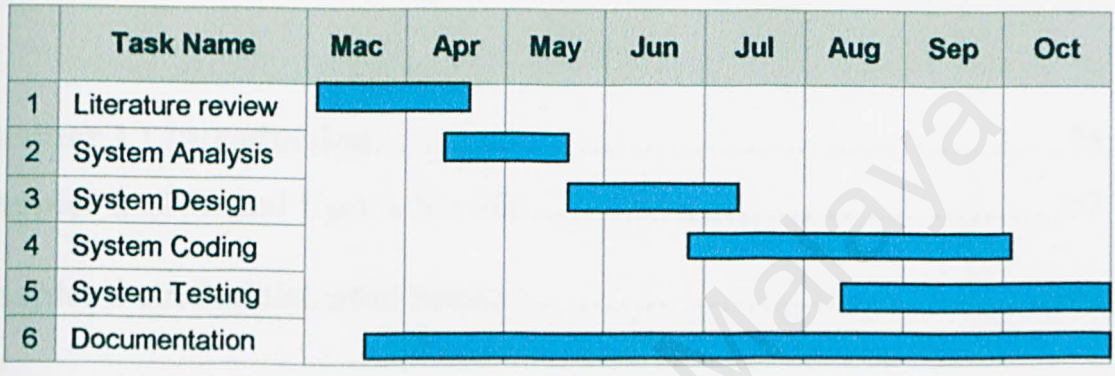

Table 7.1 Gantt chart explaining project runtime

Appendix B

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Apendix B : User Manual

Chapter 1: Introduction

Online Real Estate Management System is a system that would allow user to view information about property and administrator can keep record. As a administrator can add, delete, update and view property items.

1.1 Run Time Requirements

Hardware requirements to run the Online Real Estate Management System are as follows:

1. A computer with at least Pentium 166MHz MMX processor.
2. At least 64MB RAM.
3. Network Interface Card (NIC) and network connection with recommended bandwidth at 10Mbps.
4. Standard computer peripherals.

Software requirements to run the Online Real Estate Management System are as follows:-

1. Windows 95 and above.
2. Internet Explorer 5.5 and above

1.2 Installation Guide

These are step-by-step installation guides.

First insert the CD into the CD-Rom. Then open CD-Rom drive in your pc and right-click on <RealEstate> and click <copy>.

Then paste RealEstate to your c:\inetpub\wwwroot.

Make sure all the files in RealEstate are writeable. To do that, right click RealEstate and click properties. Then uncheck attributes read only. Also make sure the databases are writeable to.

User Manual Overview

Chapter 1 – Introduction

Brief description about Online Real Estate Management System and the run time requirements and also an installation guide.

Chapter 2 – Normal User's Section

Gives a simple explanation about how normal User's to get started with the Online Real Estate Management System.

Chapter 3 – Administrator Section

Explains modules in the administrator section of the Online Real Estate Management System.

Chapter 2: Normal User's Section

How To Use The Online Real Estate System

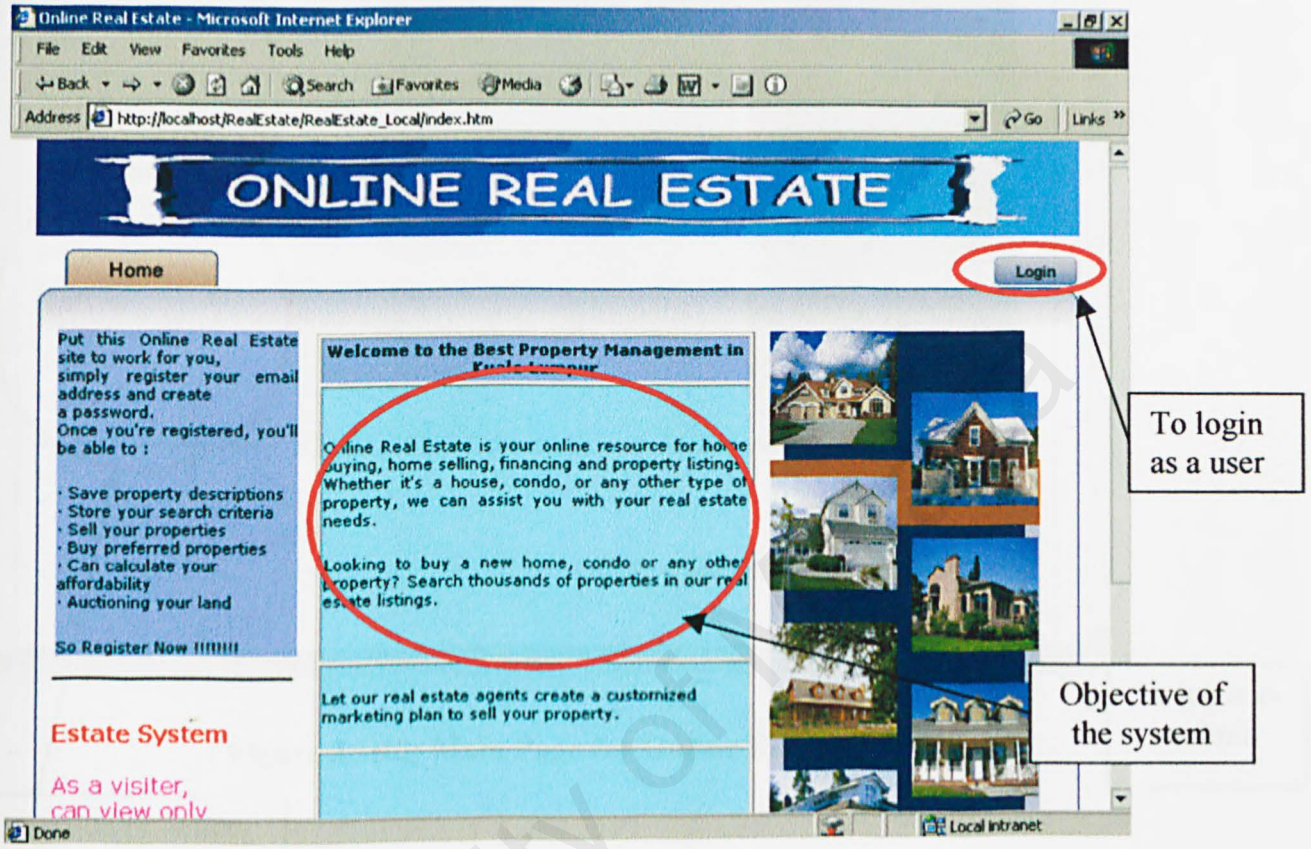

Figure 2.1(a): Main Page for Online Real Estate System

The figure above shows the main page of the Online Real Estate System. You need to type in: http://localhost/RealEstate/RealEstate_Local/Index.htm to view the page. From here, you can view the objective of the system. User have to login at the login section as a user or admin.

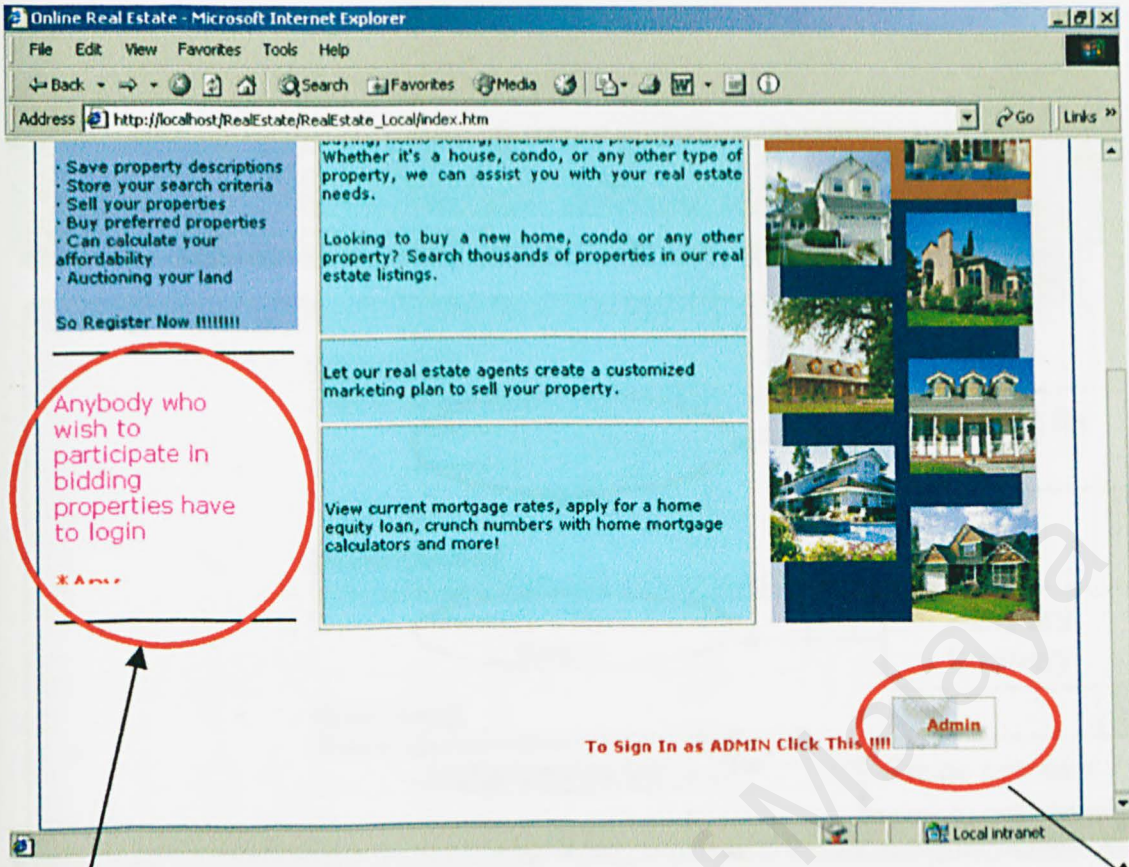

Figure 2.1(b): Main Page for Online Real Estate System

Figure 2.1(b) shows the main page of Online Real Estate System. The text gives some information about the system. It's a marquee text, which is containing welcoming notes and some useful information for users.

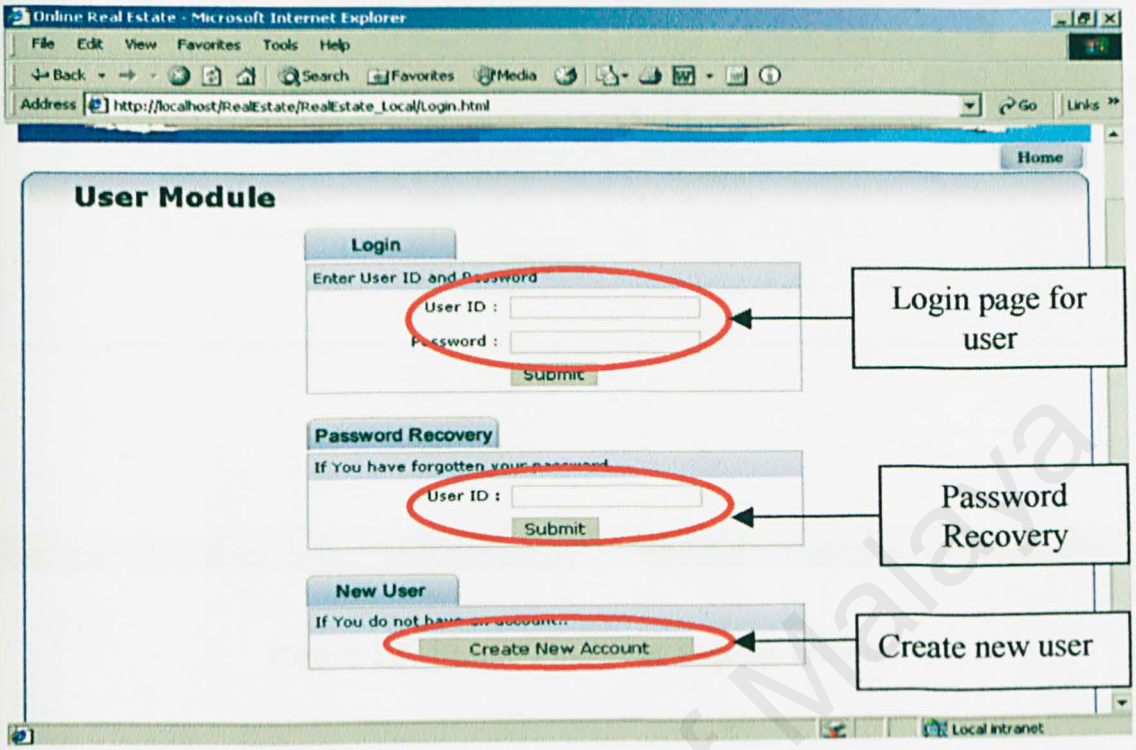

Figure 2.2 : Login Page for user

To view the function of the system user have to login by enter their user ID password. If not register yet, can register by click create new account button. If the user forgot their password, can retrieve by enter their user ID.

If you forget your password, you can retrieve your password by clicking on forgot password link. When you click at this link, a pop-up window will appear as shown in figure 2.3 in below.

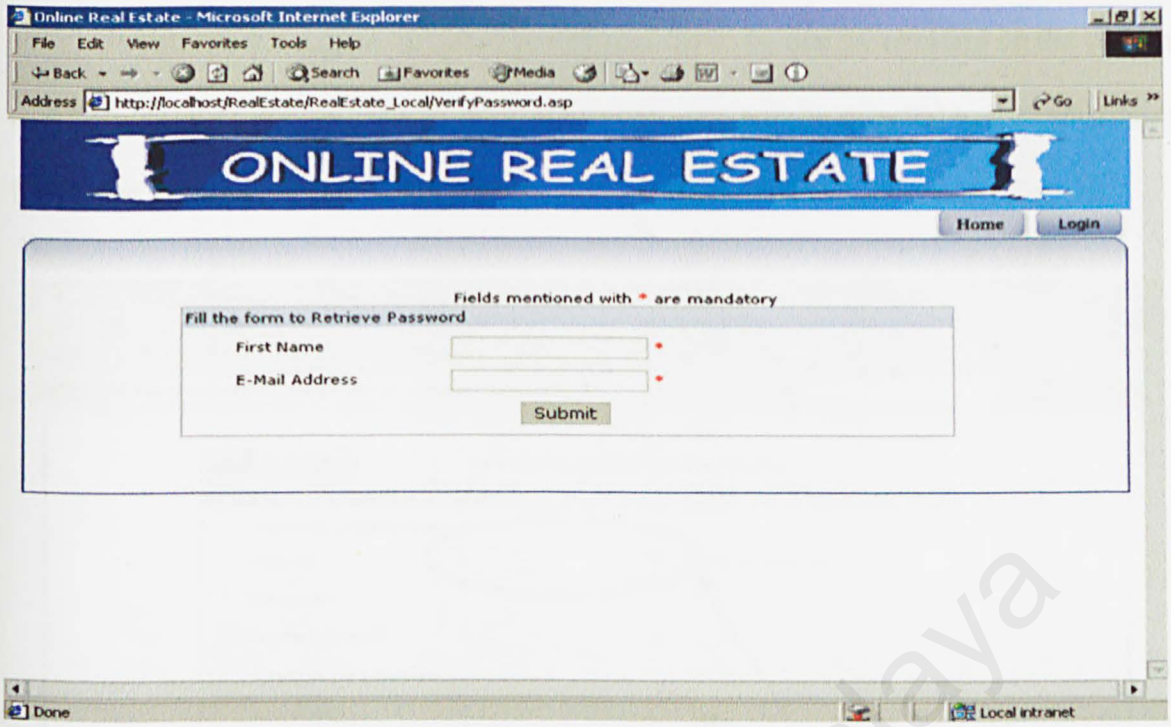

Figure 2.3: Forgot Password Pop-up Window

You just have to fill in your username and your e-mail address and the system will retrieve your password as shown in figure 2.4.

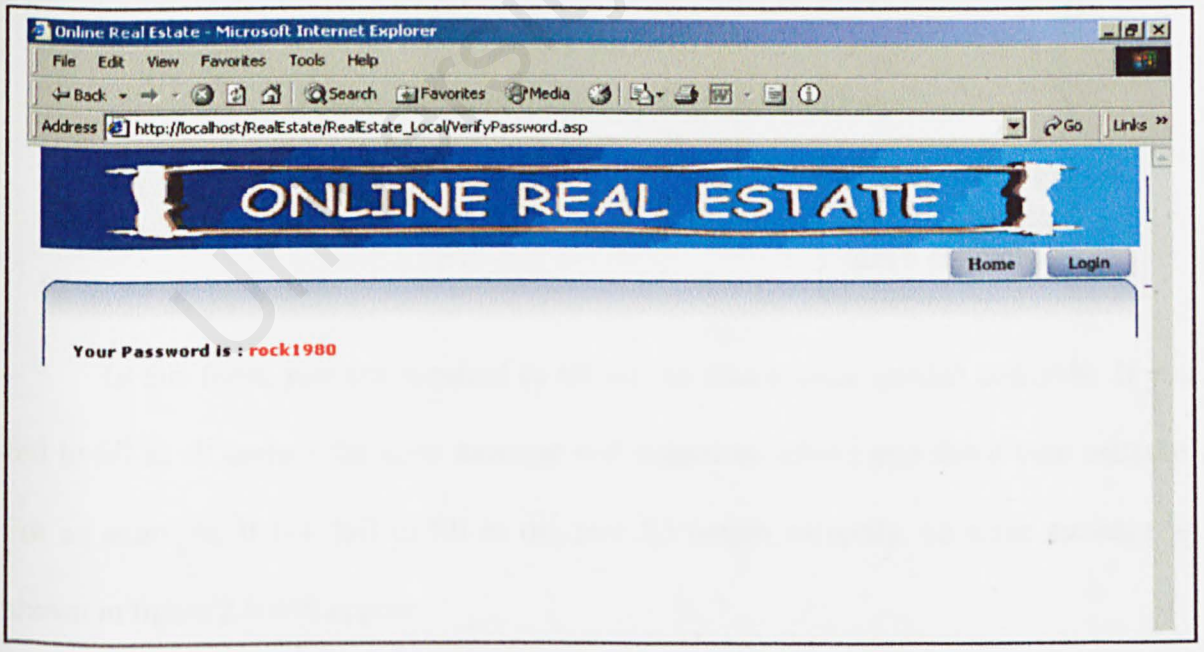

Figure 2.4: Password Retrieval Pop-up Window

If you are not a member yet, you can register to be one by clicking on the register as a new member link. When you click at this link, you will be directed to the registration form page as shown in figure 2.5.

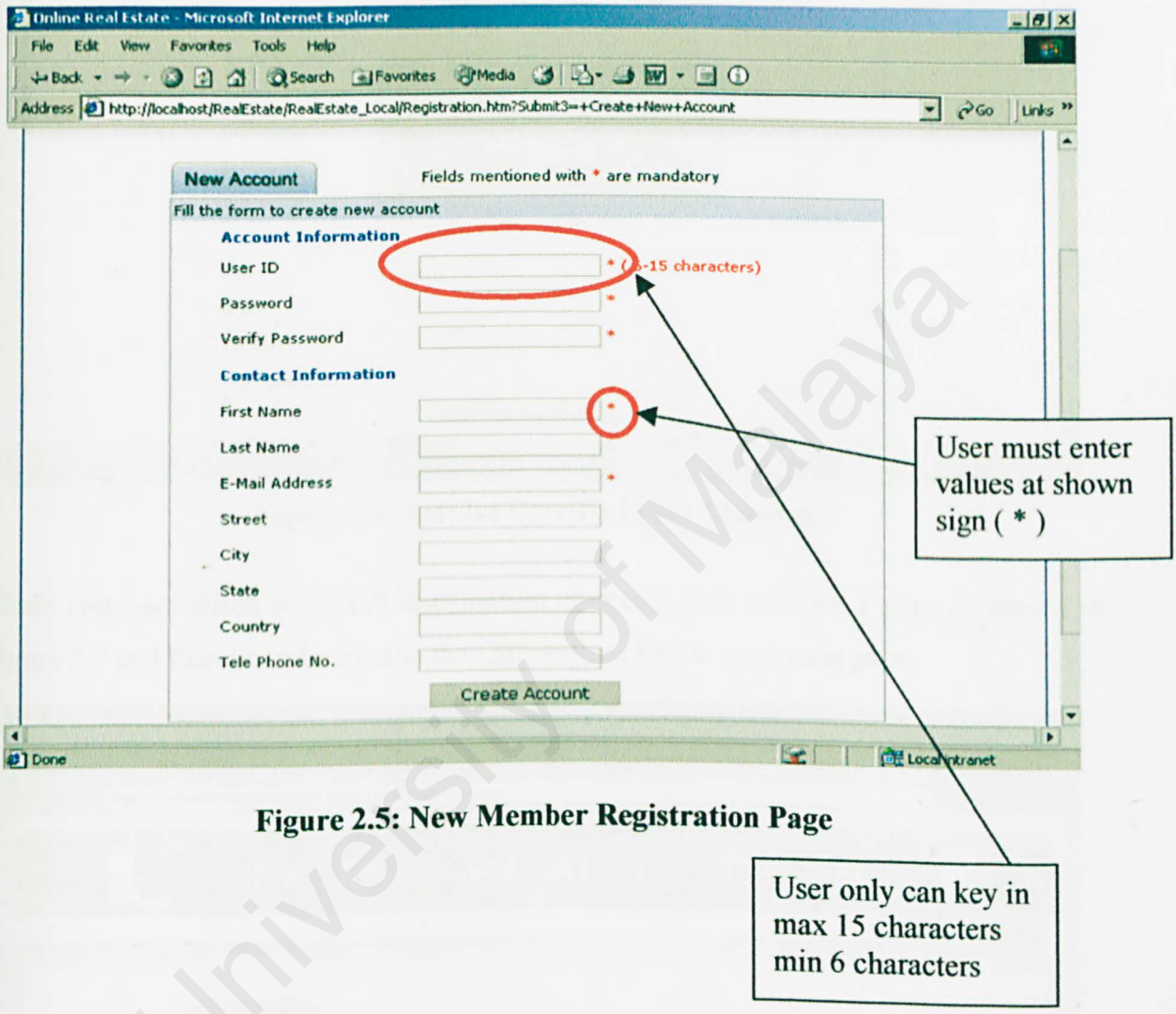

Figure 2.5: New Member Registration Page

In this form, you are required to fill all the information needed correctly. If you fail to fill in all correct, an error message will appear to inform you about your mistake. For an example, if you fail to fill in the user ID length correctly, an error message as shown in figure 2.6 will appear.

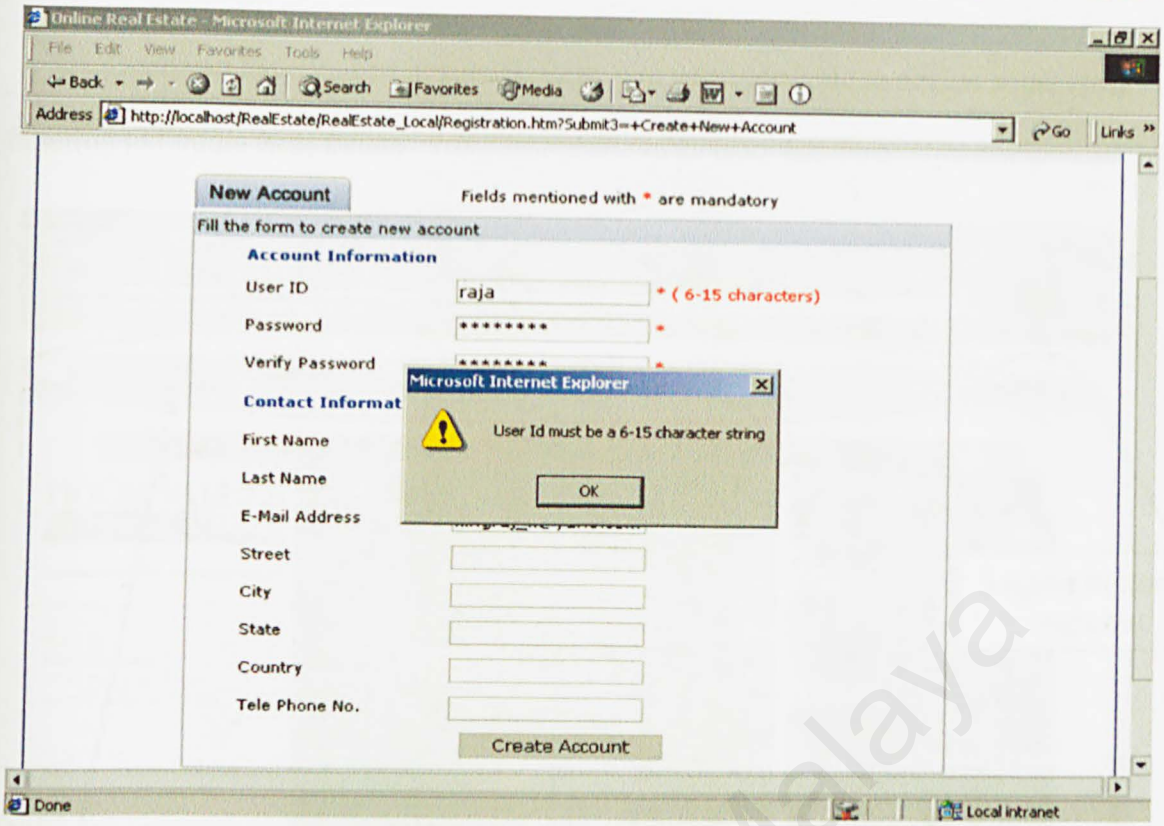

Figure 2.6: Invalid User ID Error Message

Once you have filled in all the information correctly, you will see a page as shown in figure 2.7 and then be redirected to the Online Real Estate user main page.

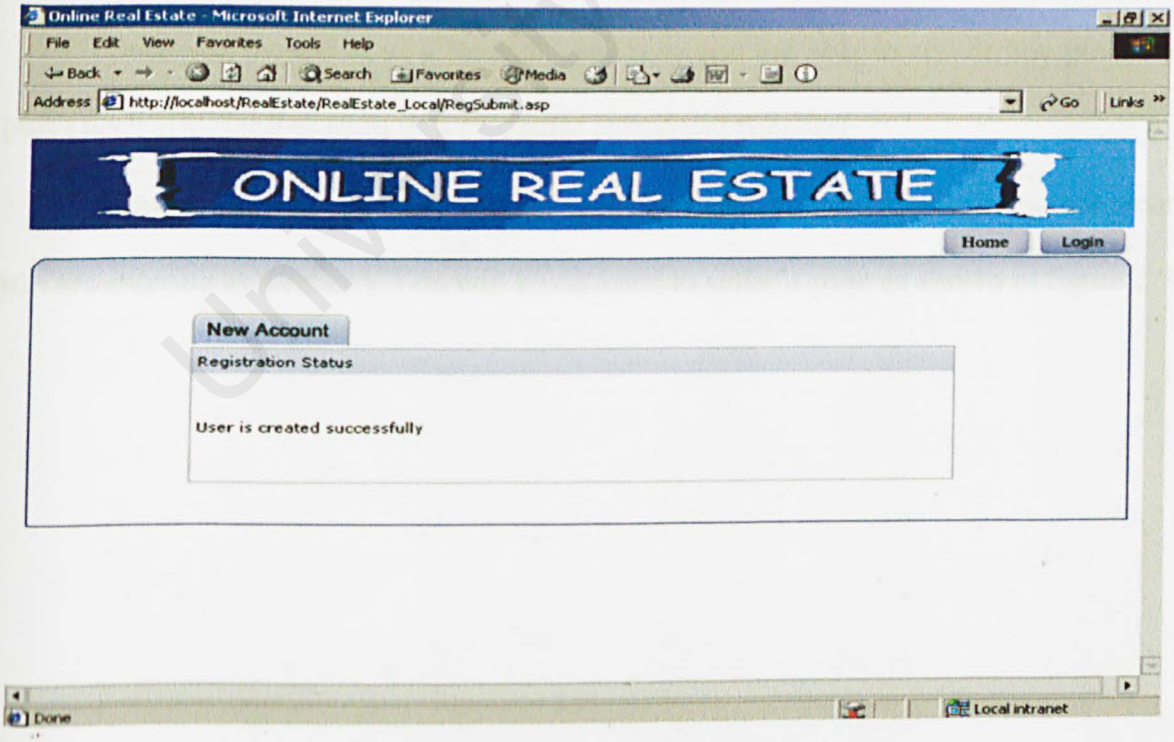

Figure 2.7: Registration Successful Page

Once you have logged in successfully, you would be able to access some extra function in Online Real Estate.

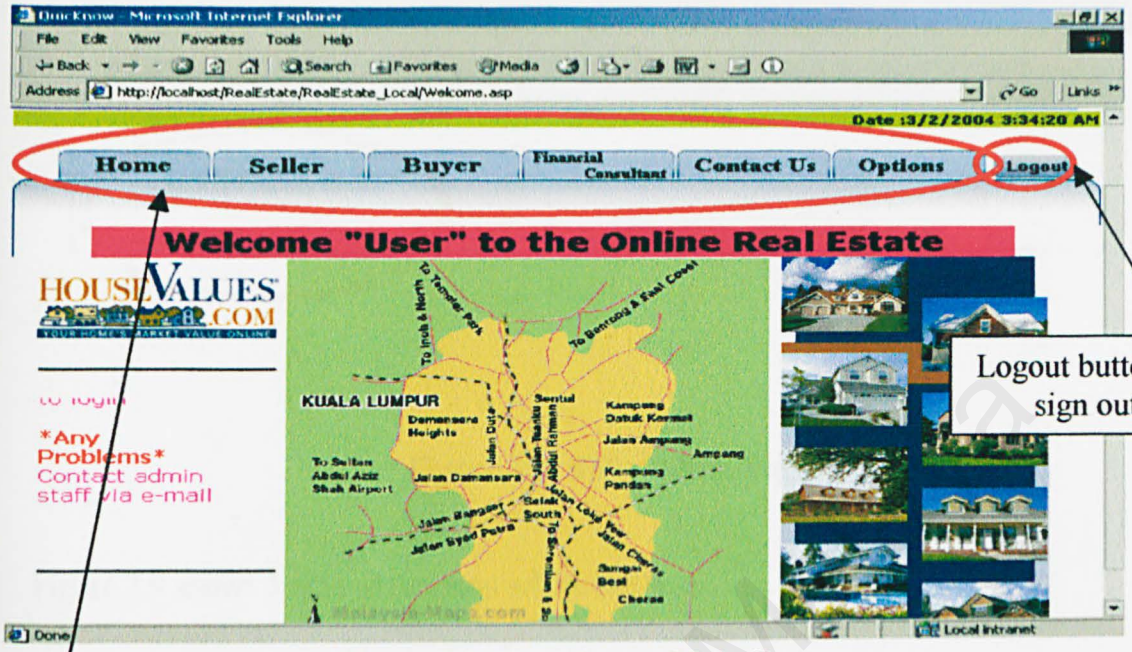

Figure 2.8: User Logon Main Page

Once you logged in as a Normal User now you are able to sell or buy properties plus check affordability level thru Financial consultant function.

Now let say you are selling property then you have to click on seller (that means you are entering as a seller). You will be directed to seller's page as shown in figure 2.9

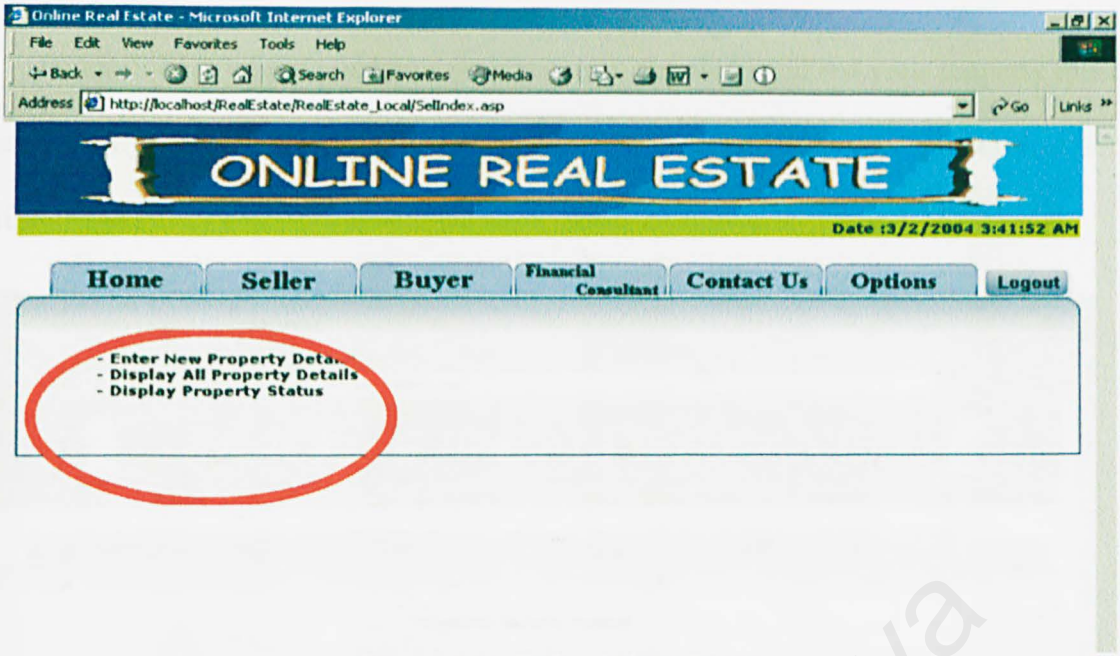

Figure 2.9: Seller Main Page

Figure 2.9 shows 3 type of function where you can :

- Enter your details of property you want to sell
- View your property that has been accepted or not by Administrator
- View whether your property has been requested or bought

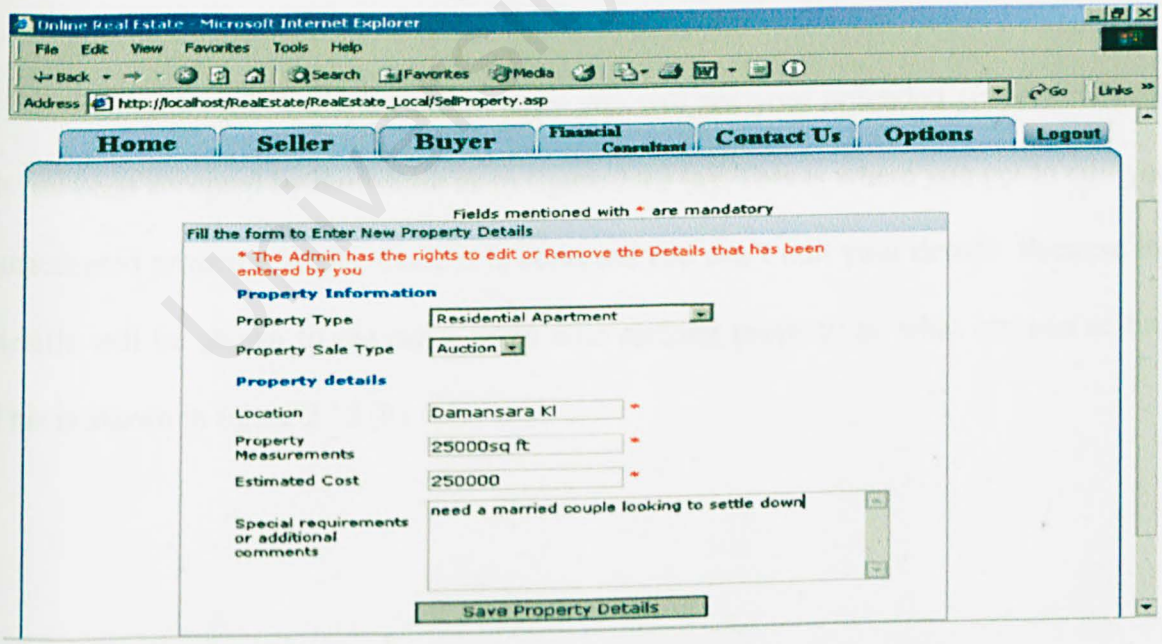

Figure 2.10: Enter Property Details to sell

Figure 2.10 is where you enter your property details to sell but your property must be accepted by the administrator for other users to view and buy your property. After entering the property details, the next page you see is as shown in figure 2.11

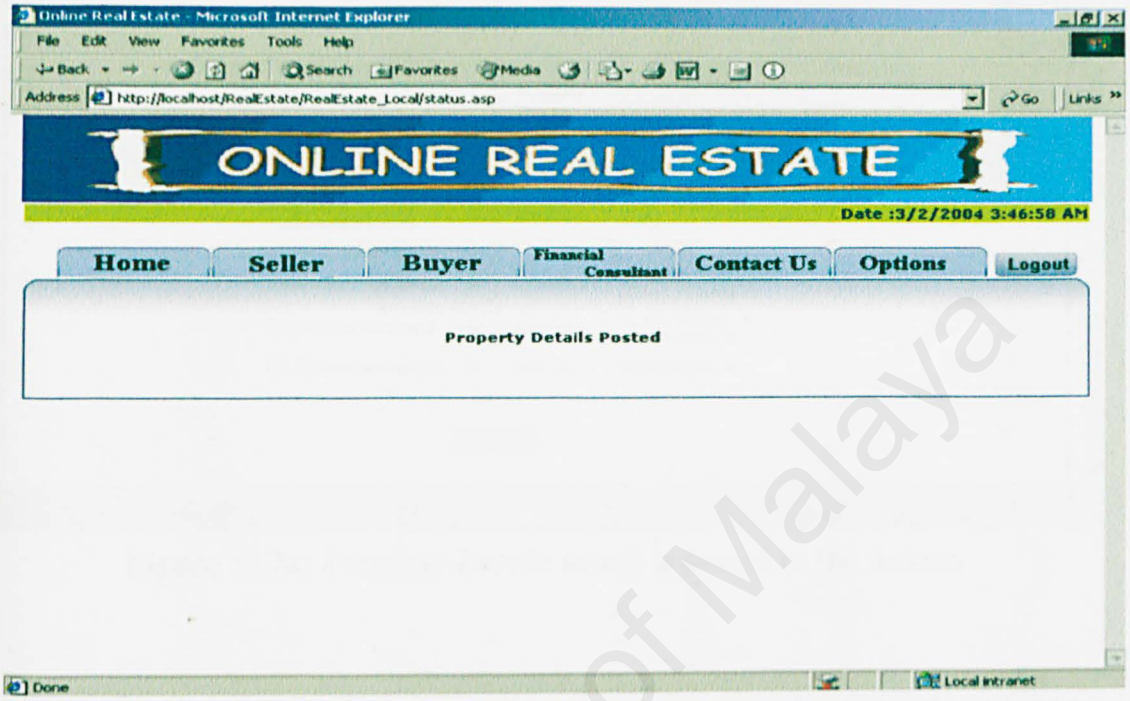

Figure 2.11: Property Details to sell is posted to the Admin

Once you click display all property you will see your uploaded property whether it has been accepted by the admin as in figure 2.12 (a). This is where you get to edit your unaccepted property details. Once it is accepted you can't edit your details. Because this details will be shown to the other users who seeking property as what are you selling. This is shown in figure 2.12 (b)

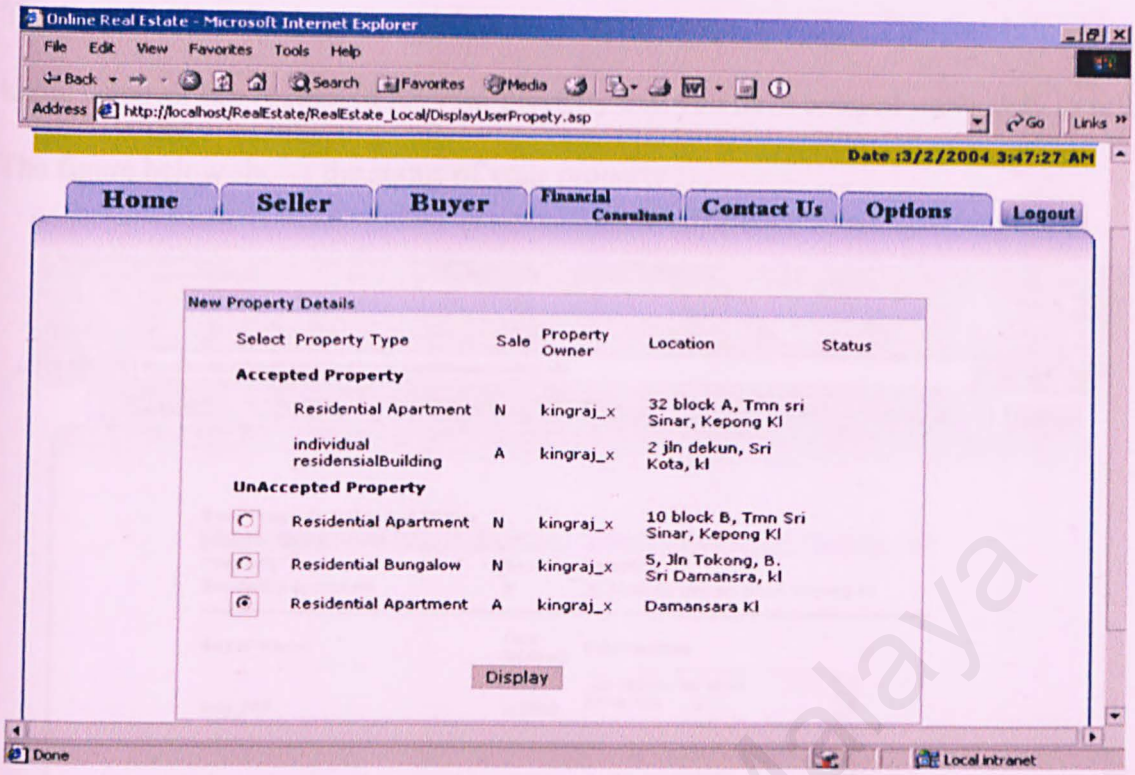

Figure 2.12a: Property Details to sell is posted to the Admin

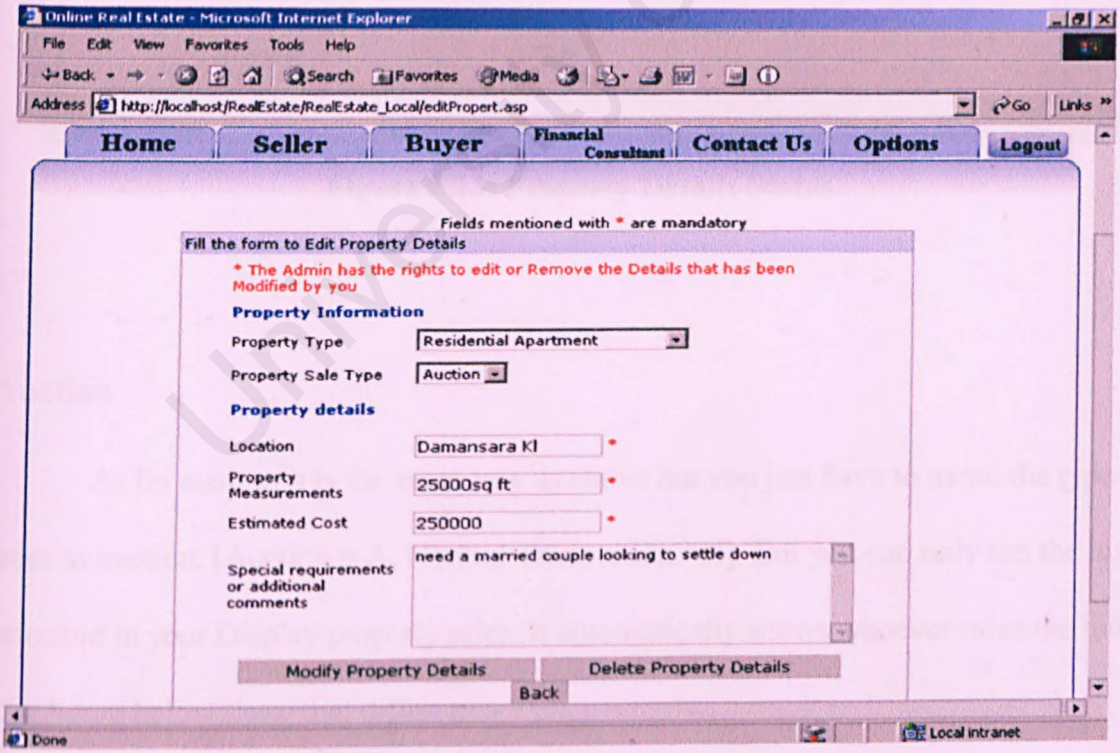

Figure 2.12b: Property Details to sell is posted to the Admin

The last link for seller's part, which is the Display property status. This link brings you to know whoever has requested for your property that you have entered previously to sell. The figure below shows the status of your property :

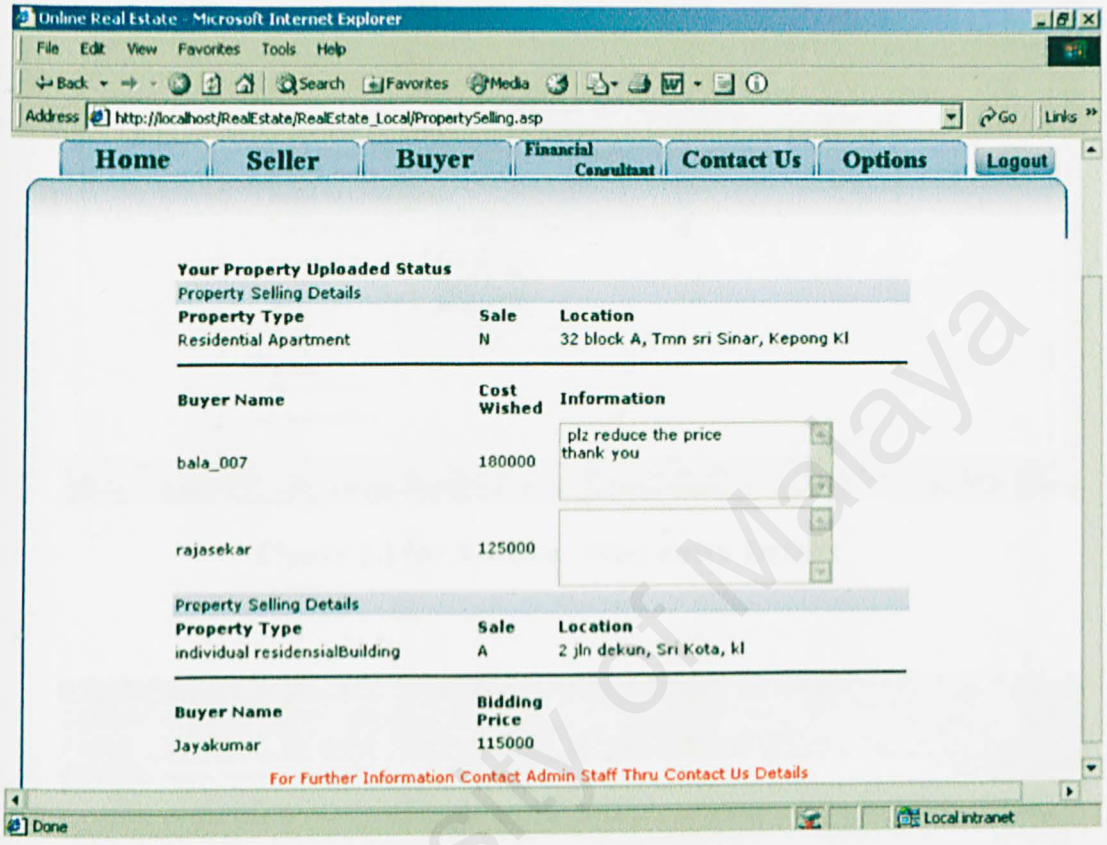

Figure 2.13: Property Details Status

Auction

As for auction it is the same way as above but you just have to name the type of sales as auction: [Auction = A, Normal Transaction =N]. But you can only see the highest price bid in your Display property sales. It automatically shows whoever raise the bid. The figure below show that different :-

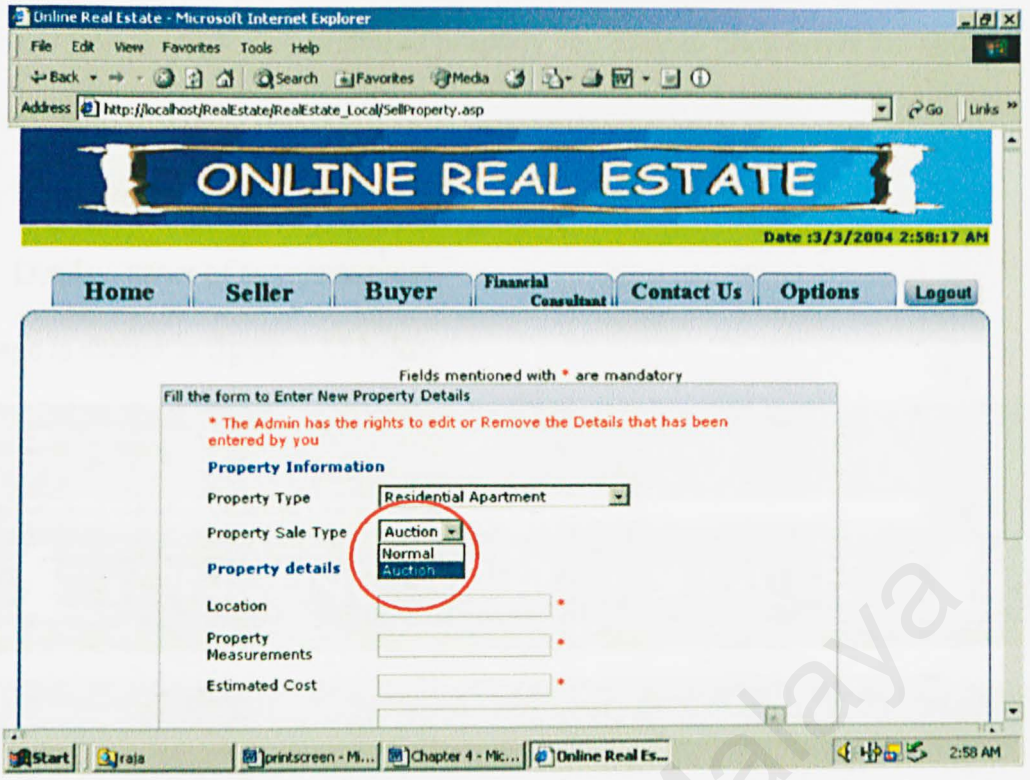

Figure 2.14a: Auction –New entry Details

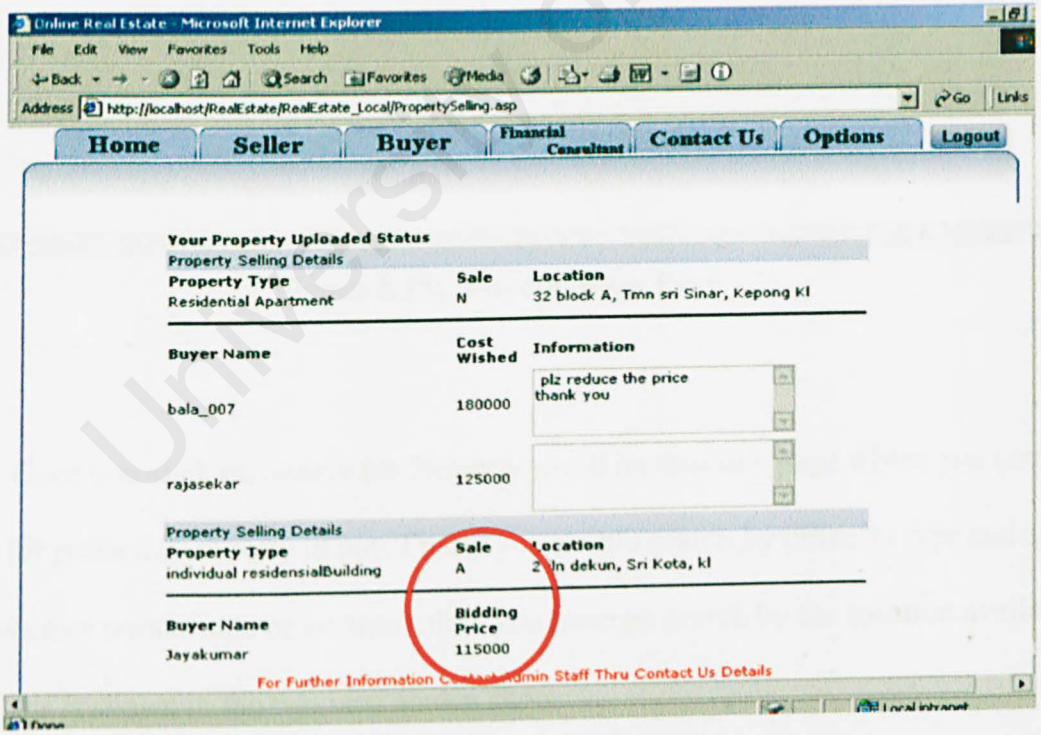

Figure 2.14b: Auction – Status Details

As for user who wants to buy preferred property you have to click buyer tab and you will see a page with two links that is :-

- Search for property
- Display status of buyers request

This page is shown in figure 2.15 below

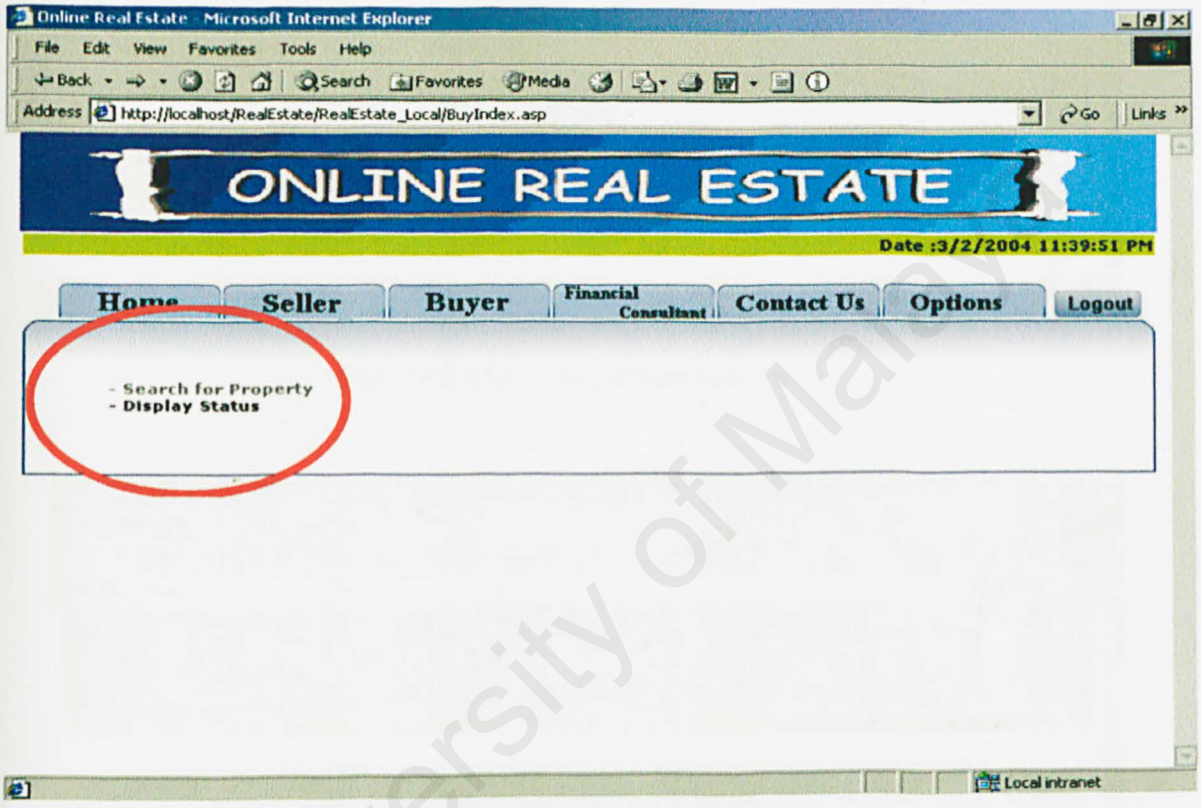

Figure 2.15: Buyers Main Page

Once you click on Search for Property you'll be sent to a page where you could search for preferred property to buy. Firstly you should search by property type and sale type (whether normal sale or auction), then you have go search by the location available there. This is shown in the two next screen shots :

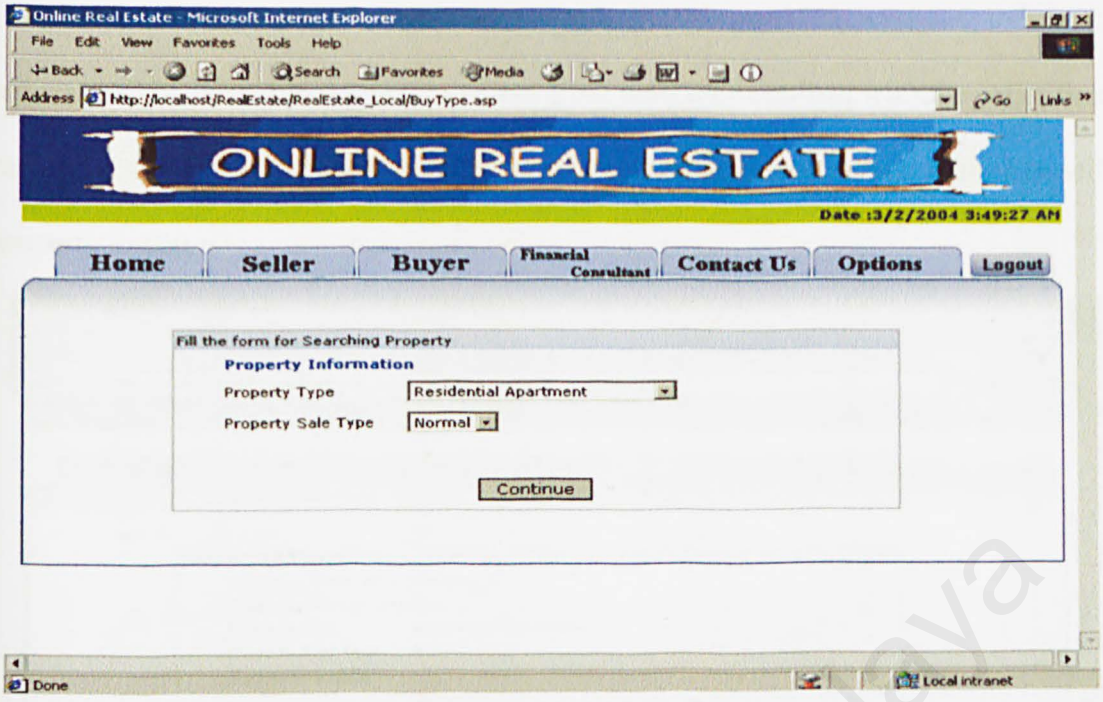

Figure 2.16a: Properties search

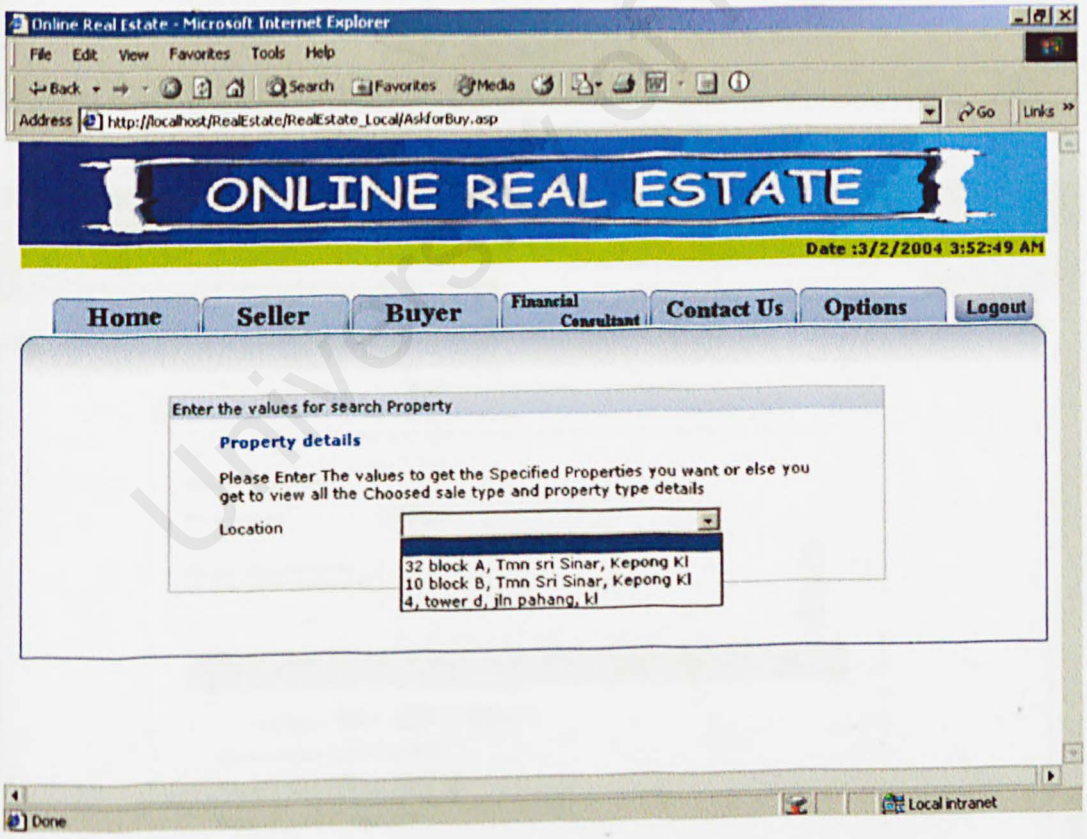

Figure 2.16b: Properties search

After this you have to select the property that you want then request to buy it. The request will be posted to the admin where from here they confirm with the seller then you can check the status whether the seller have accepted your request and willing to sell the property to you.

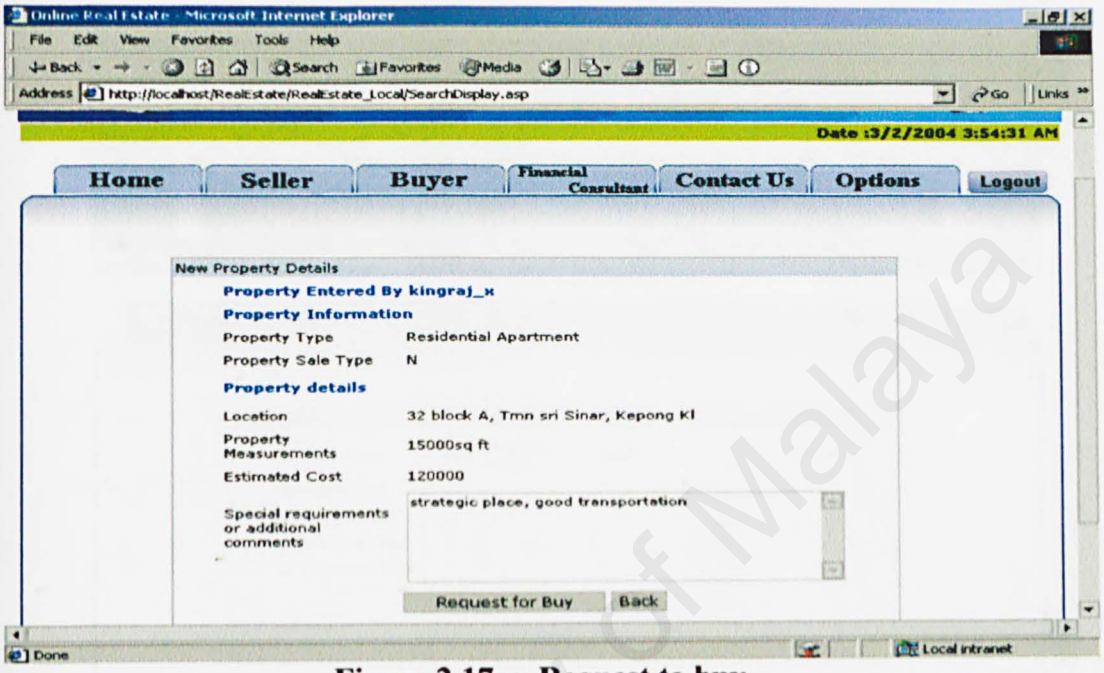

Figure 2.17a: Request to buy

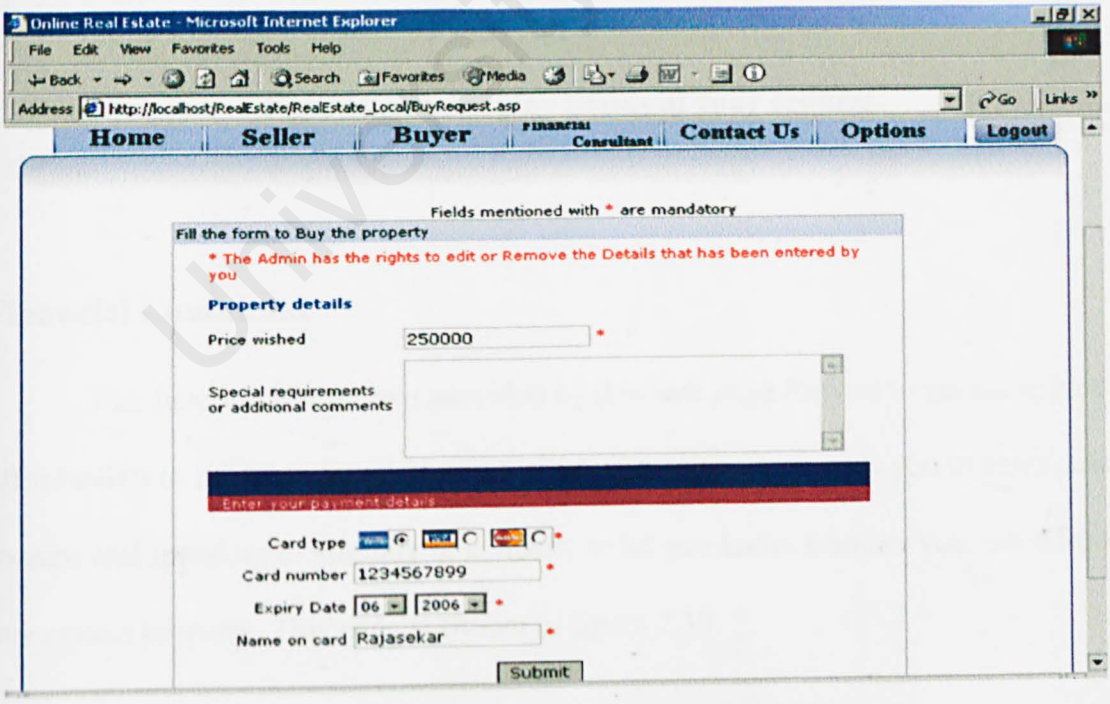

Figure 2.17b: Entering Credit Card Information

After this process you will see a page that informs your request has been posted to administrator.

Another link that display status is to view whether your request has been accepted by the administrator. This page is shown in figure 2.18.

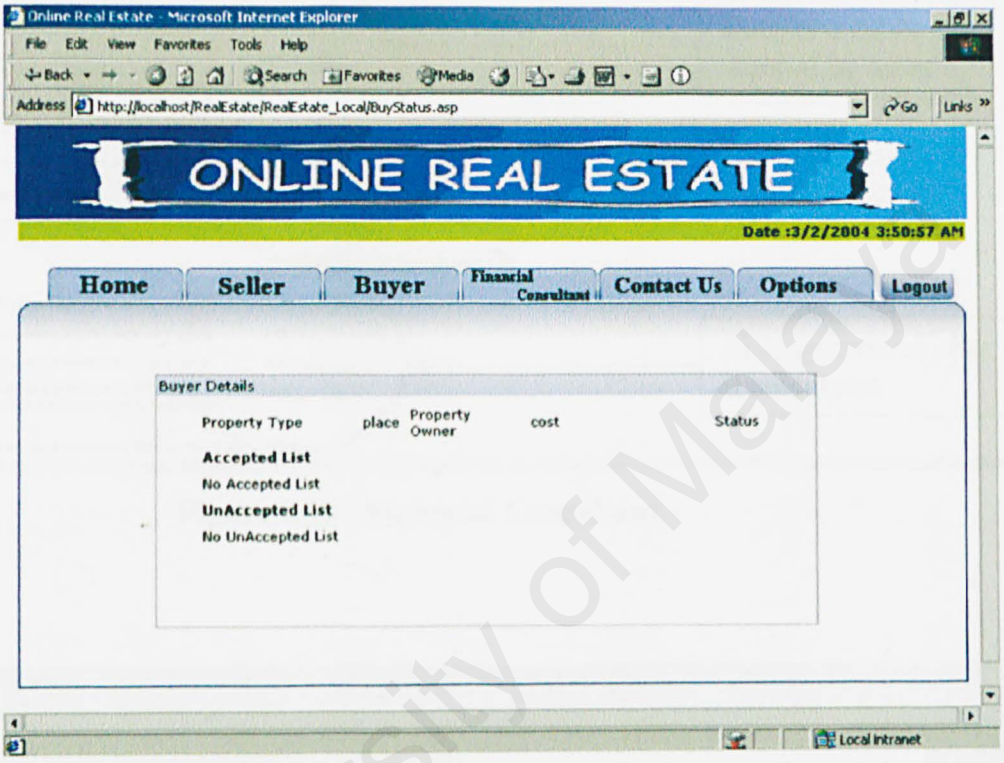

Figure 2.18: Display Status of your request

Financial Consultant

This function is a service provided by this web page for you to get some idea of affordability to buy a property using a formula. This function needs you to enter details of income and spending to monthly or annually to let you know whether you can afford to buy certain property. This page is shown in figure 2.19

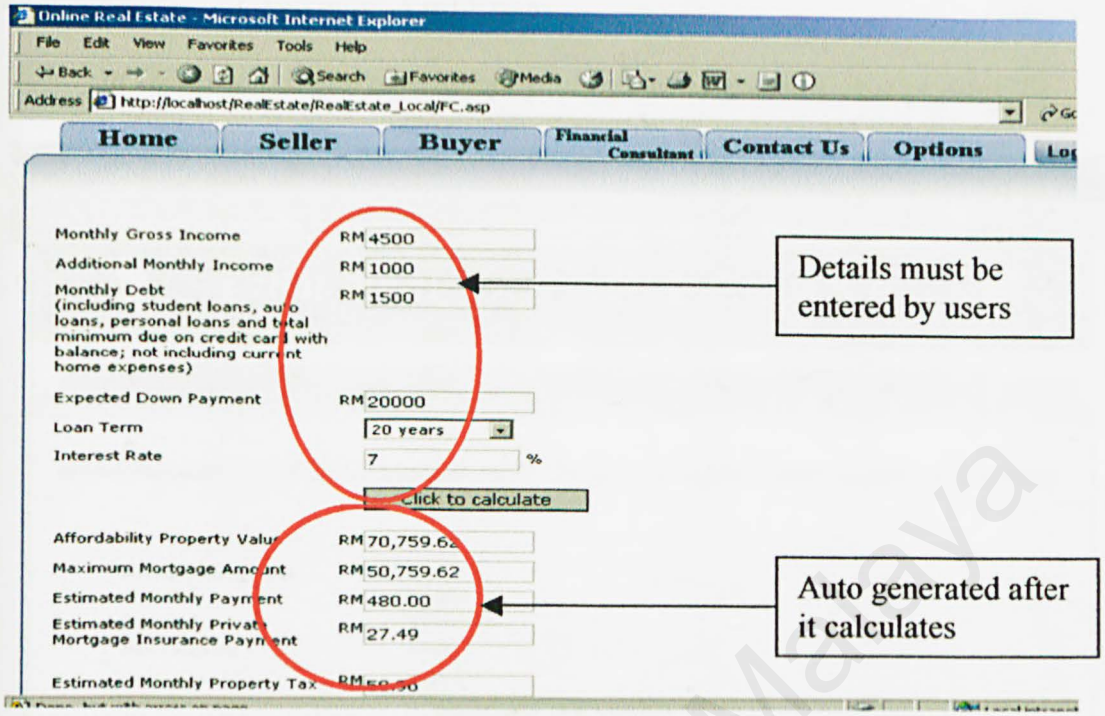

Figure 2.19: Financial Consultant

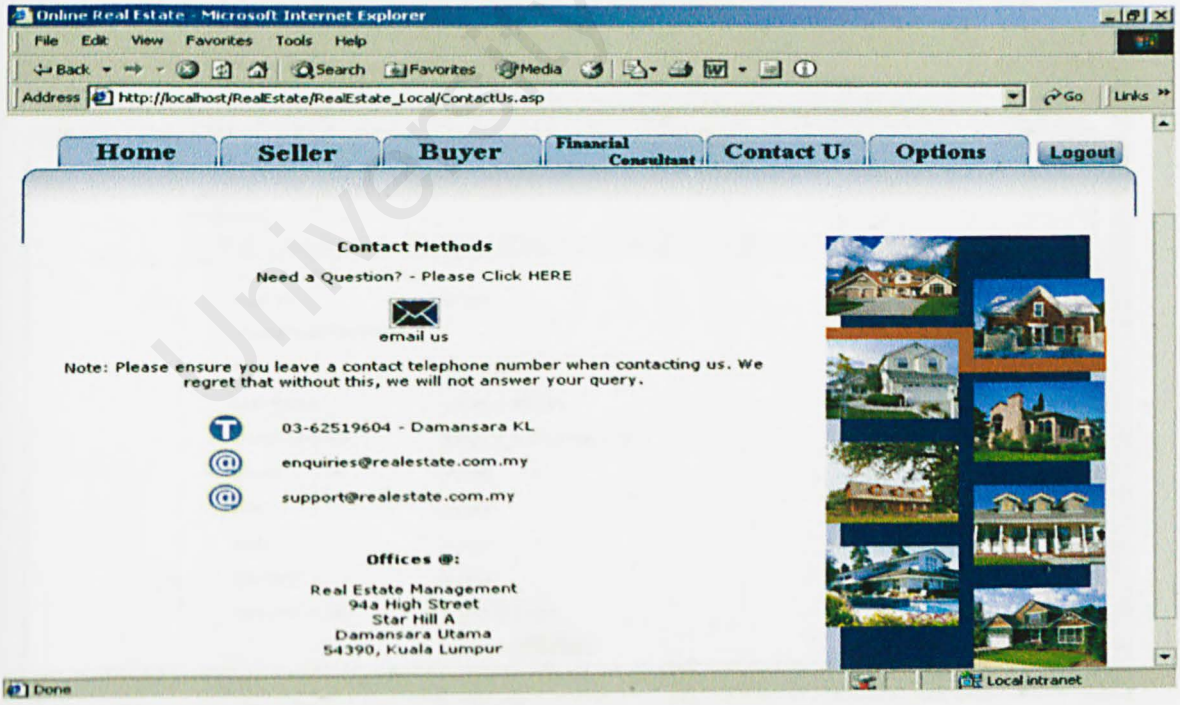

Figure 2.20: Contact Us Page

Figure 2.20 shows the contact information page in order to enable users to contact the management of the Online Real Estate.

In **Options** Tab you can change your password and edit your profiles:

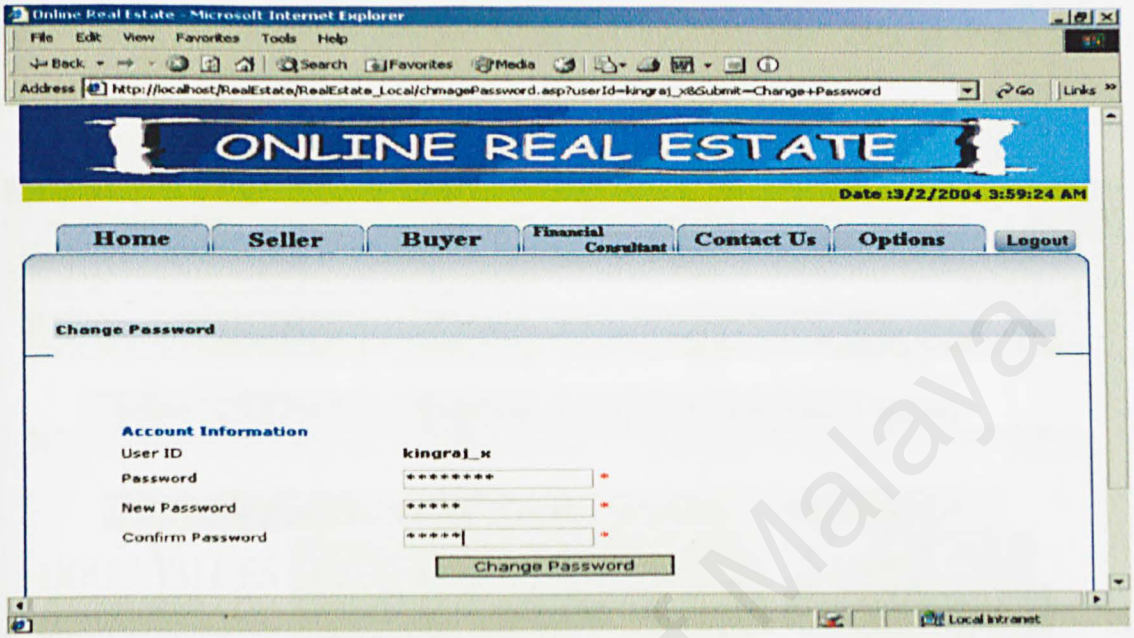

Figure 2.21: Change Password

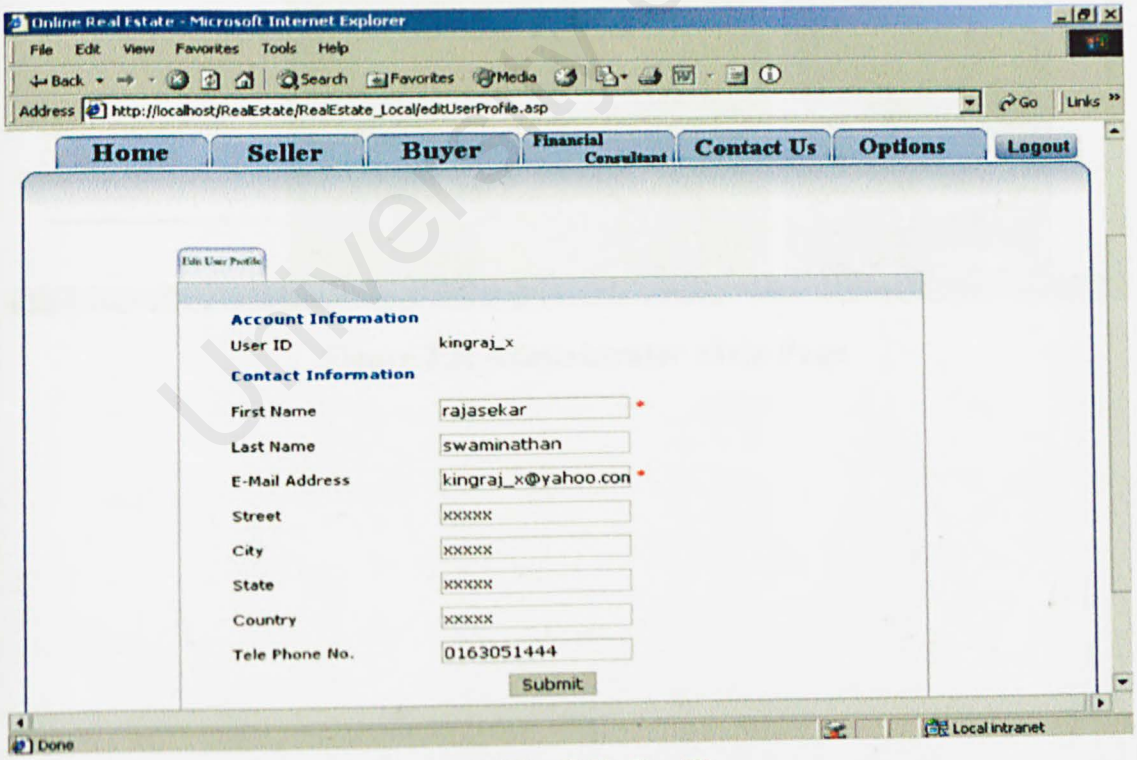

Figure 2.22: Edit Profile

Chapter 3: Administrator Section

The administrator of the Online Real Estate Management System would be able to access the administrator site by logging in at the Online Real Estate main page. The administrator then would be directed to the Administrator Main Page as shown in Figure 3.1.

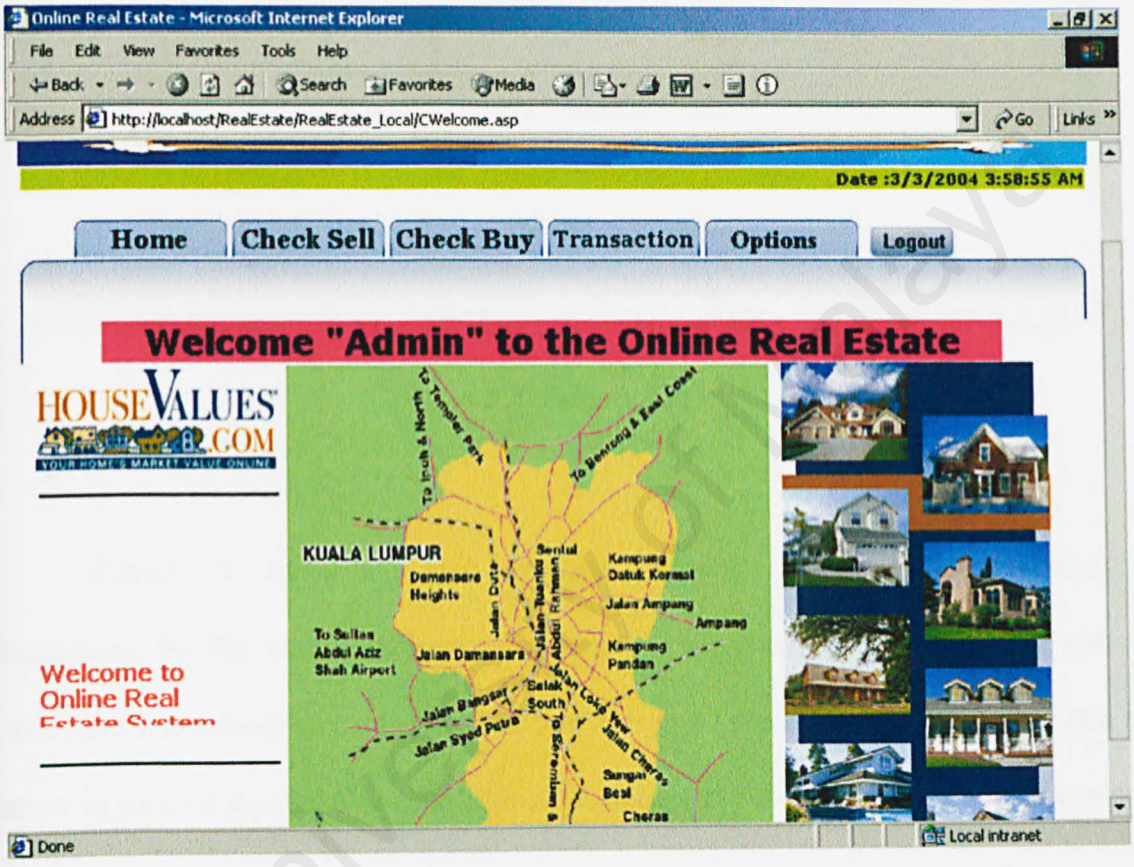

Figure 3.1: Administrator Main Page

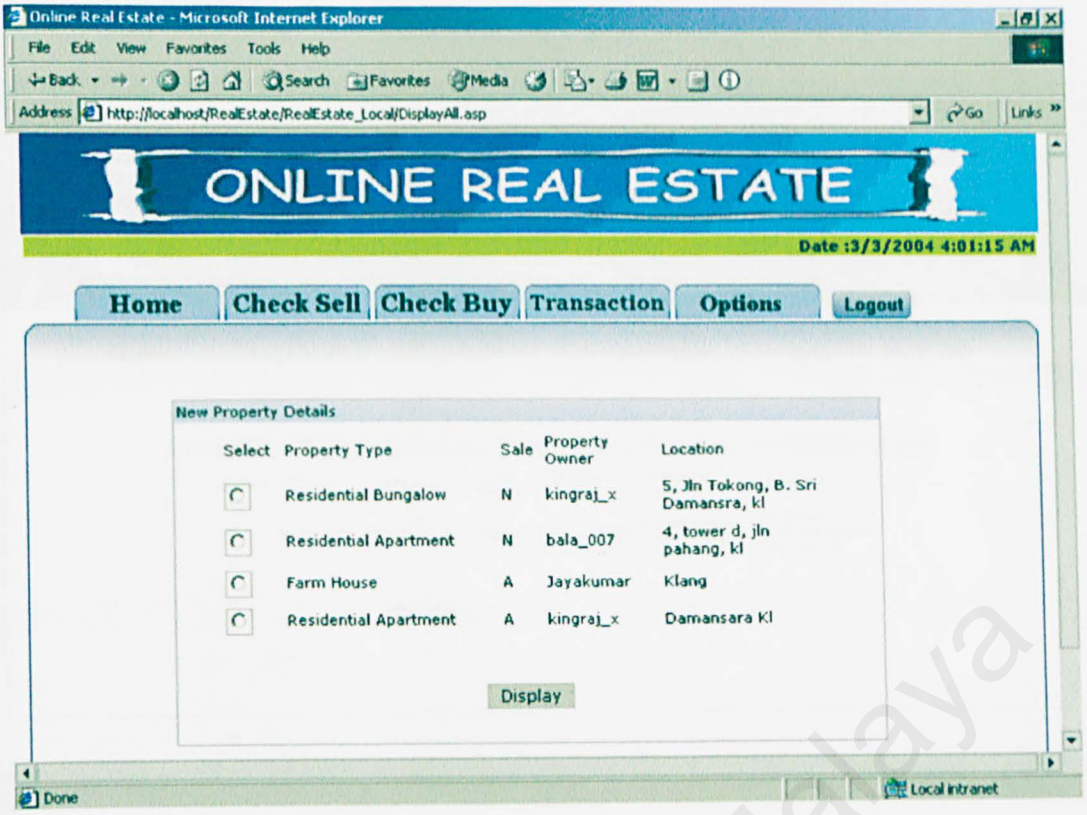

Figure 3.2: Sellers Check

Figure 3.2 shows the new property uploaded by normal users waiting for acceptance by the admin. Where administrator can view the details, and can add laboratories inventory item. Other than that can view report of the items, and can add, delete or edit the details. Once the admin has accepted the details then the user can see it in their display property page.

Next figure 3.3 shows the buying part where the admin can see who has requested to buy any property and after this the admin will contact the seller and inform, if only the seller accepts it then the admin will sell the property to the buyer.

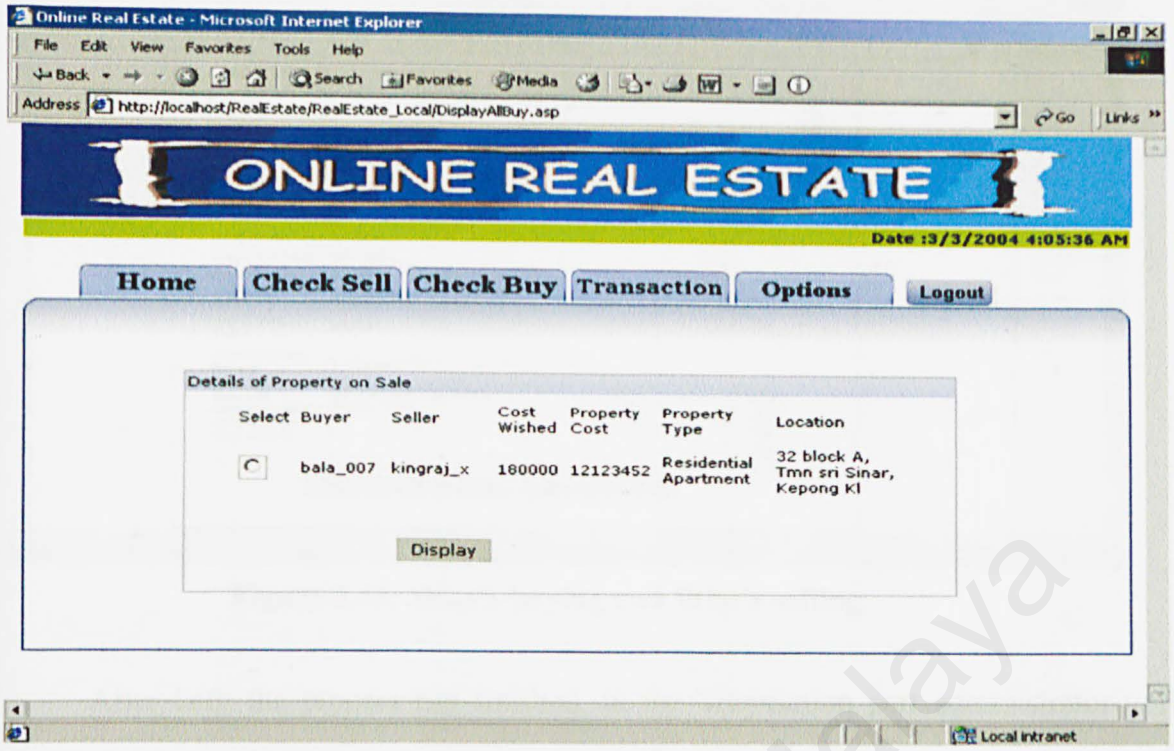

Figure 3.3: Buyers Check

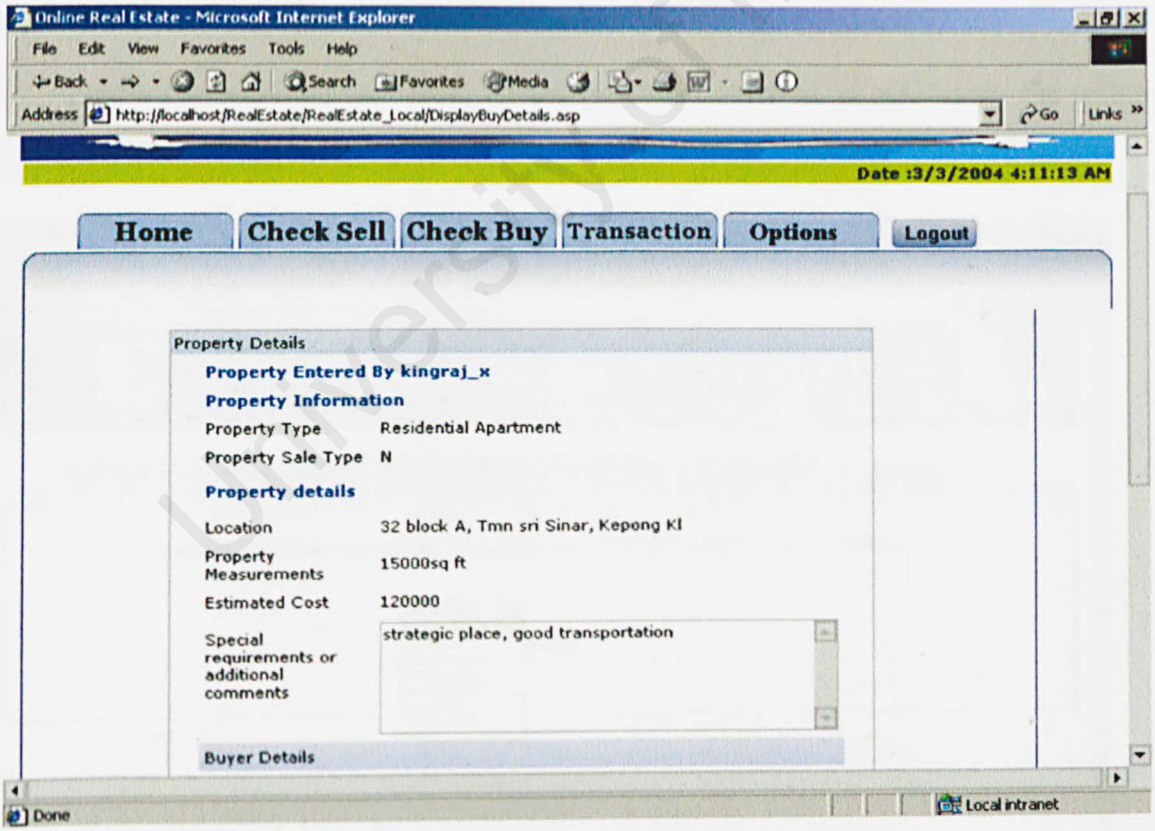

Figure 3.4a: Who's buying and Who's selling

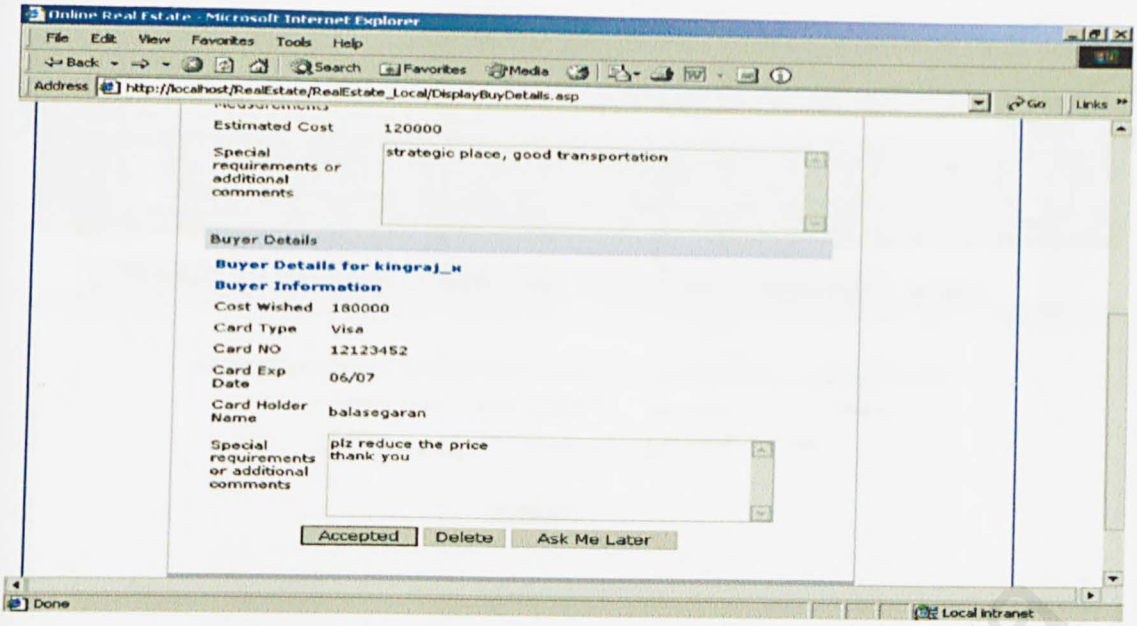

Figure 3.4b: Who's buying and Who's selling

After both the process has finished, in the Transaction part administrator will finalize the deal between the buyer and the seller. Following four figures below shows the process.

Firstly the administrator looks at the property which is in sale using the sellers name (figure 3.5a)

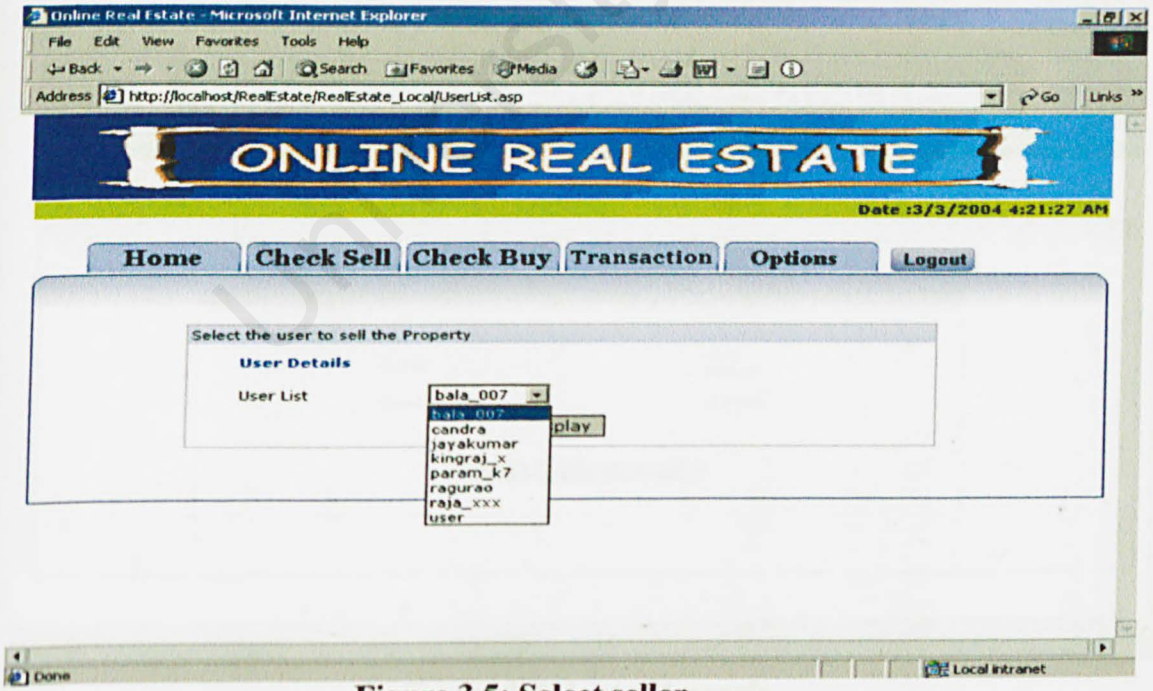

Figure 3.5: Select seller

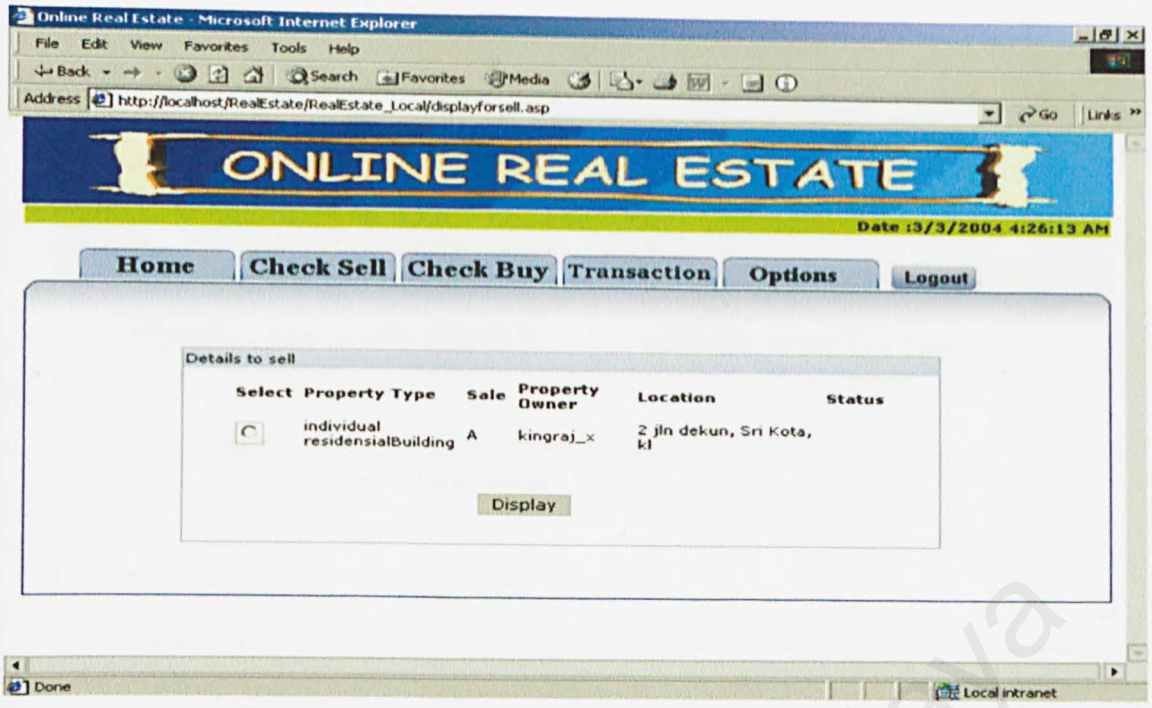

Figure 3.6: Property of the selected seller

Figure 3.6 shows property of the selected seller which is on sale after the admin click the display button the next page shows the list of buyers who is requesting for the same property (figure 3.7)

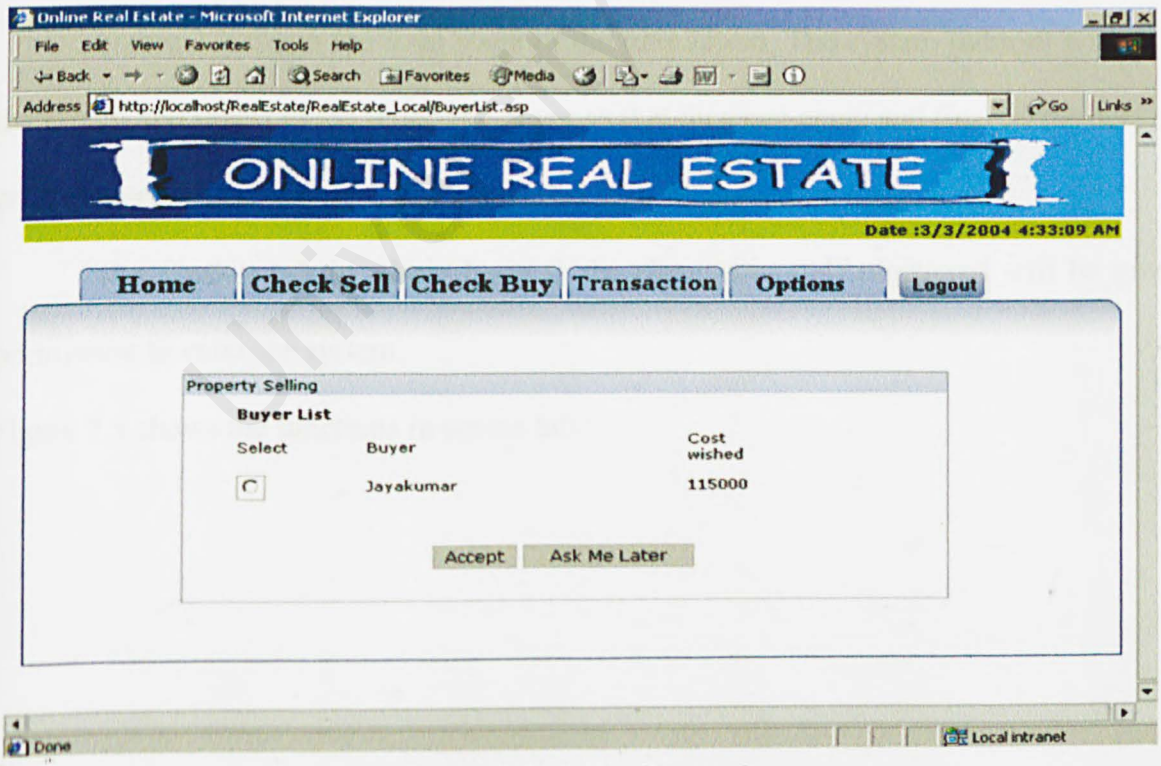

Figure 3.7: List of buyer's

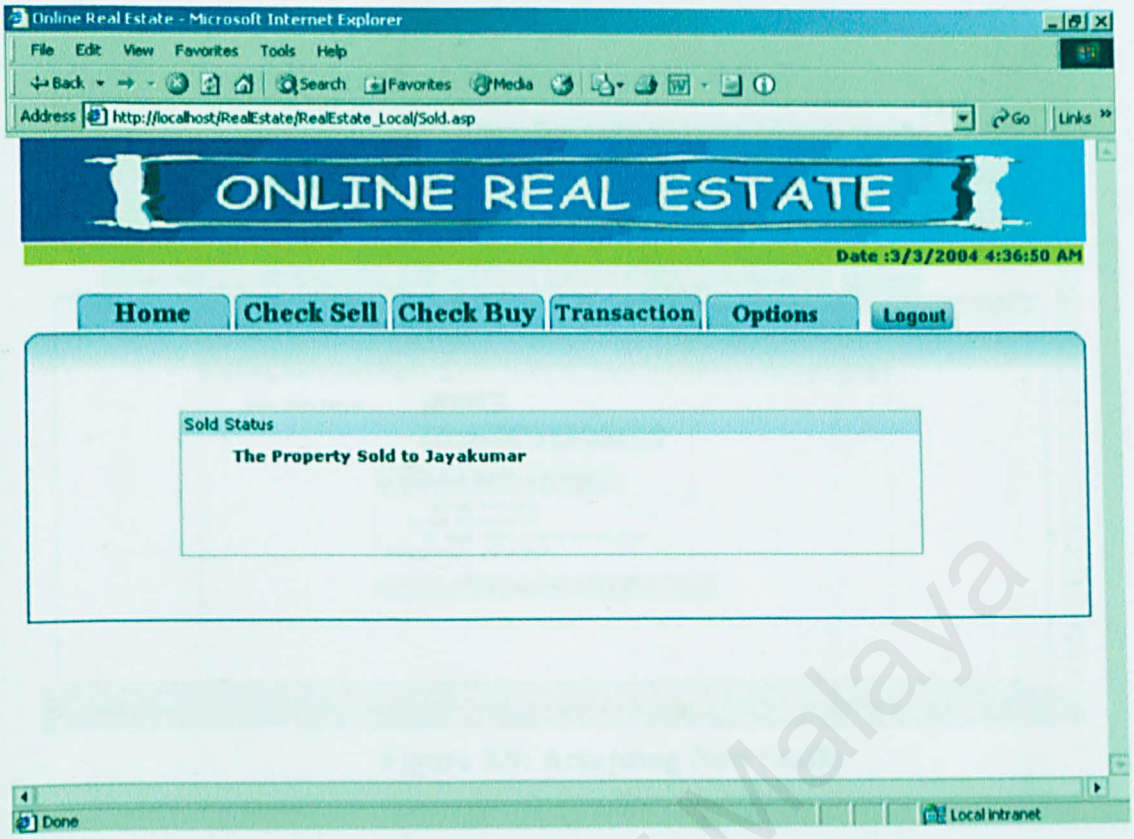

Figure 3.8: Finalizing Deal

Figure 3.8 shows the final stage of the transaction. The system (admin) will send the e-mail and report to the seller and buyer so that they can come and finalize the deal on paper according to the property management law.

The **Option tab** in admin login is the place new staff registered will be given permission to enter the system.

Figure 3.9 shows the functions in option tab :-

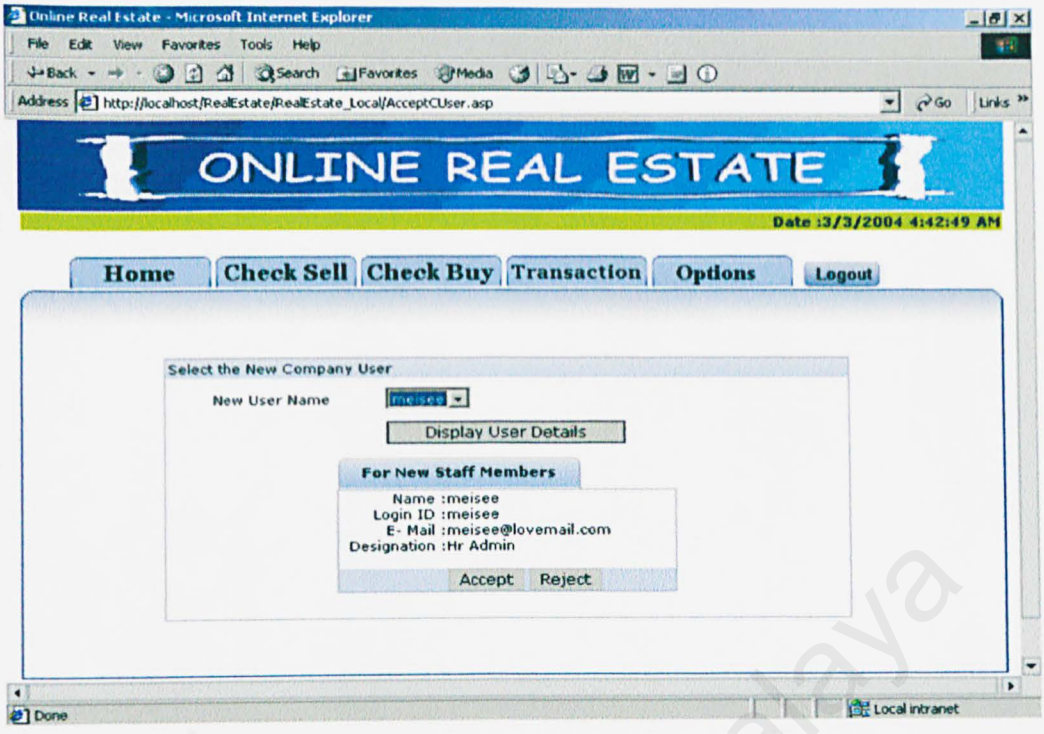

Figure 3.9: Accepting New Staffs